Before the

Federal Communications Commission

Washington, D.C. 20554

In the Matter of

A National Broadband Plan for Our Future

GN Docket No. 09-51

COMMENTS OF THE STATE OF ALASKA DEPARTMENT OF EDUCATION AND EARLY DEVELOPMENT (EED) THE NATIONAL BROADBAND PLAN: REQUEST FOR INFORMATION ON BROADBAND NEEDS IN EDUCATION, INCLUDING CHANGES TO E-RATE PROGRAM TO IMPROVE BROADBAND DEPLOYMENT

NPB PUBLIC NOTICE # 15

GN Docket Nos. 09-47, 09-51, 09-137

CC Docket No. 02-6

WC Docket No. 05-195

DA 09-2376

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Introduction

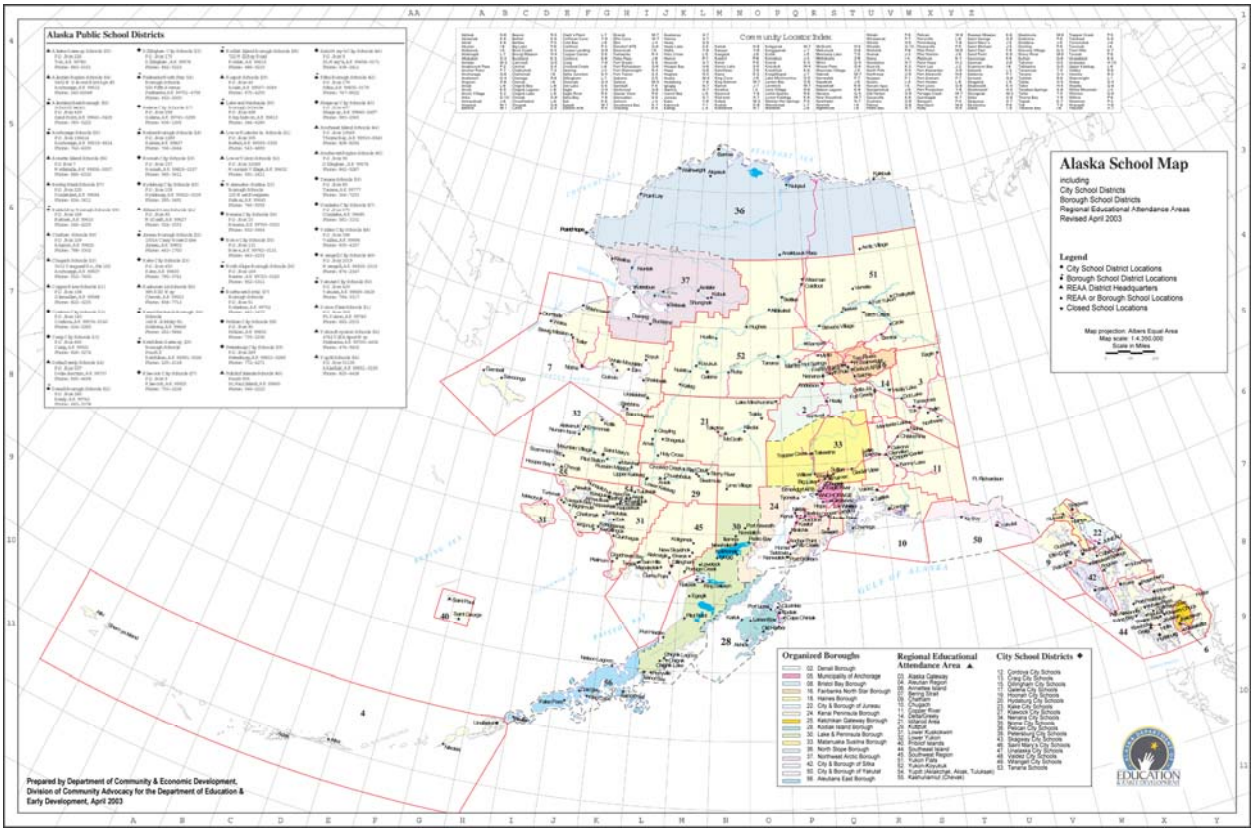
The Alaska Department of Education & Early Development (EED) includes the Commissioner, the State Board, the Alaska State Library, and the staff necessary to carry out the functions of the Department. EED provides general supervision over the public schools of the state and among other duties studies the conditions and needs of the public schools of the state, adopting or recommending plans and administering or evaluating federal and state grants as needed.

Alaska's approximately 500 public schools are organized within 54 school districts. These include 34 city and borough school districts and 19 Regional Educational Attendance Areas. REAAs serve students living in towns and villages in politically unorganized rural areas. Alaska schools vary greatly in size.

High schools in Anchorage, the state's largest city, may serve more than 2,000 students. Schools in other urban areas such as Juneau, Fairbanks, the Kenai Peninsula, or the Matanuska-Susitna Valley are similar to schools in small cities in the rest of the United States. However, many schools in remote areas are small, some with as few as 10 at a variety of grade levels. These schools may be many miles from population centers and services, and accessible only by aircraft or boat. In remote villages, schools often serve as centers of community activity.

Alaskan students come from a variety of cultures. In urban areas, students may be white, Native Alaskan, Asian, Hispanic, African-American, or from dozens of other world cultures. In remote villages, students and residents may be predominantly Alaska Native—Yup'ik or Inupiaq Eskimo, Aleut, Athabaskan, Tlingit, Haida, or Tsimshian. Cultural values and traditions are an important part of

school programs and EED has adopted Cultural Standards for Students to help assure that young Alaskans are aware of and sensitive to their physical and cultural environments.



Unfortunately, the physical disbursement of Alaska communities and schools makes broadband deployment extremely difficult and expensive and limits connectivity to delivery by satellite in large remote areas throughout the state. Nevertheless, EED is pursuing a statewide public telecommunications broadband network together with a statewide distance-education clearinghouse to be made available over that network. Alaska has long been on the cutting edge of using computers and distance education to expand opportunities for students to learn. Virtually all schools teach computer technology, and many students participate in

distance education and classroom activities on worldwide computer networks. However, the employment of up-to-date technology to expand training opportunities and information exchange among students, educators and school administrators is seriously inhibited by a lack of affordable broadband statewide.

In a dozen bulleted points, Alaska's educational challenges are the following:

- Approximately132,970 students, spread out over 586,412sq. miles;
- Approximately 37% of 506 schools have fewer than 100 students;
- Most schools are inaccessible by road. The largest district, North Slope, is 88,000 sq. miles (slightly larger than Minnesota) and has just 10 schools and 2,104 students;
- Approximately 100 schools, 20% of Alaska's total, employ three or fewer teachers;
- 109 different languages, over 90% of them Native Alaskan languages, which are the primary home language in several districts;
- There are 2.4-3.3 students per instructional computer in Alaska and approximately 75% of schools in use Macintosh computers exclusively;
- 90% of schools report they have internet access at the classroom level;
- Few schools report they rely on only dial-up access, but many schools do not have land-based cable, and rely on satellites, which can often delay transmission;

- Availability of parts, technical assistance, and well-trained tech staff in remote areas is an ongoing challenge;
- Local Hire can be a challenge because villages can be so small and average education may be low, it is sometimes difficult to hire and train staff locally; and
- Teachers in the bush "multi-task" and coach sports, run the community library, and mentor after school; and
- School Computer Labs often have the only computers in the village. In order to use on-line providers, the school must open and staff computer labs, which often cause scheduling or staffing conflicts.

For these reasons, the EED is a strong proponent and supporter of advanced broadband deployment to all schools, libraries and communities within Alaska. The USAC-administered E-Rate program, which is the largest primary funding source for Alaska school district broadband network deployments,[1] is essential to the maintenance and improvement of these networks.[2] Without universal service support administered through the Schools and Libraries Division (SLD), these networks would collapse, as at least one did during a brief hiatus in E-Rate funding. Consequently, although we ourselves are seeking certain changes to the E-Rate program, we also encourage the FCC to take great care in evaluating and implementing comments made in response to NBP Public Notice #15 and, given the relative success of the E-Rate program, to follow the Hippocratic injunction and "first, do no harm!"

[1] The E-Rate program has funded Alaska schools and libraries with almost $200 million in telecommunication and Internet connectivity support over the last 12 years.

[2] Alaska rural health care networks are similarly dependent on the USAC administered Rural Health Care program and the Rural Health Care Pilot Project.

It is also important to note that not every Alaska community has a school, library or rural health care center, and to recognize that communities without these federally recognized anchor institutions – the only one's currently eligible to apply for federal Internet access support - will receive no direct benefit from strengthening broadband support to such institutions. Left out are all the communities with less than 10 children of school age and the thousands of correspondence school students and home-schooled children in Alaska.[3]

With respect to Alaska communities, a balanced approach to broadband deployment support in the National Broadband Plan must address the needs of the *unserved* and *underserved*, as well as those of anchor institutions. Alaska's rural areas are the least advanced in broadband service in the entire United States. In its NTIA/RUS comments of April9, 2009, the State of Alaska went on to say:

> "When it comes to access to broadband, Alaska residents are the most 'unserved' and 'underserved' population in the United States. Public safety agencies in rural Alaska do not have interoperable communications. The unemployment rate in these areas is consistently higher than anywhere else within the contiguous 48 states. In rural Alaska access to health care and educational opportunities are limited, but both have expanded in communities with reliable broadband service. Broadband infrastructure and access is particularly important in Alaska where other traditional

[3] Alaska restricts state school funding to communities with 10 or more children. The number of communities which fail to receive state school funding because of low or decreased populations with fewer than 10 children fluctuates from year to year around 100 out of almost 400 communities.

infrastructure such as roads connecting communities together often do not, and may not ever, exist.

The barriers to broadband access in Alaska include vast distances, challenging topography, a lack of basic infrastructure, and affordability. Improving access to and expanding broadband infrastructure across rural Alaska requires innovative cooperative projects across the private and public sectors, including state agencies, university, native corporations, and regional non-profit agencies and providers."[4]

In the same comment, the State went on to point out that:

"Alaska's rural areas are, for the most part, limited to satellite connectivity. There are only limited areas in rural Alaska which have any terrestrial microwave distribution systems which deploy broadband services across limited areas. Much of Alaska's rural communities have no access to broadband service at all. Where satellite broadband connectivity does exist, downstream and upstream speeds are only a fraction of 1 mbps. In correspondence with U.S. Senator Stevens the Regulatory Commission of Alaska (RCA) reported obtaining information on internet availability for 341 Alaska communities. This research indicated that approximately 47 Alaska communities are without local dialup or broadband internet service. The vast majority of the 294 communities with Internet availability

[4] April 9, 2009, State of Alaska BTOP Comments at: http://www.ntia.doc.gov/broadbandgrants/comment.cfm?e=BD712663-F93B-4ED5-9817-EB6E29A6C2DA

through local dialup or broadband receive signal at or below 256 kbit/s speeds."[5]

Even with an active telecommunications sector and substantial federal support, EED foresees an inevitable 5-15 year development cycle before advanced broadband speeds at affordable prices are deployed statewide via fiber and microwave.[6] During those years, the majority of Alaska schools – those restricted to broadband access via satellite – are counting on a new generation of satellites[7] to nudge broadband speeds upwards from current Tier 2 speeds to Tier 3-5 speeds.[8]

As mentioned recently at President Obama's *American Indian Summit*, Alaska is "a place to get away from it all," including broadband Internet services. But the state does not want to remain broadband-free as it is currently is in the majority of its physical territory; instead, Alaskans want ubiquitous broadband, with residents free to take advantage, or not, of affordable broadband wherever they live. It should be a matter of choice so that when President Obama comes to Alaska, he will have affordable broadband available should he need it.

[5] The referenced research is the Regulatory Commission of Alaska's Internet Connectivity Spreadsheet (updated 1/12/2007) to be found at: http://rca.alaska.gov/RCAWeb/Documents/Broadband/Internet_connectivity-070112.pdf

[6] The 29 Alaska applications under the Stimulus Act totaled $1.3 billion but it is not expected that more than a handful of these proposals will be funded. The University of Alaska is currently managing a National Science Foundation grant and working in partnership with the Alaska CLEC, General Communications, Inc (GCI), to test various methods for deploying fiber over tundra.

[7] The new generation of high-speed satellites are being led by Japan's Kizuna and Hughes Jupiter satellites, the first of which is operational and the second scheduled for launch in January2012.

[8] Throughout this comment, reference will be made to the FCCs seven tier structure for measuring broadband speeds as stated in its Order of June 12, 2008 at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-89A1.pdf

This brief introduction is intended to put the unique broadband deployment dilemma of Alaska in context as one reads the following comments which come not only from EED but from school districts across Alaska. School district staff have been encouraged to speak openly and their remarks have not been edited.

The format used below is to first give any comment from EED in Size 14 font, followed by statements from various school district technology coordinators in Size 12 font. Some school districts are also filing comment separately.

BROADBAND DEPLOYMENT DATA

1. We seek information on the current state of broadband connectivity, device availability, and adoption in U.S. schools and classrooms.

a. We seek statistics on the current state of network connectivity as well as information on technology deployment projects that address connectivity, access, and adoption.[9]

The basic issue for Alaska is not merely to make broadband available but to make it affordable and desirable. National satellite service coverage means that minimal broadband is already available in most places in the United States and the lack of higher Internet penetration via satellite means that these services are simply unaffordable, undervalued in terms of their utility, or, given their current technical limitations, simply not worth the price being asked. Broadband satellite services have shown they can meet basic broadband requirements, with certain exceptions (e.g., high-speed streaming or synchronous applications), but it remains to be seen to what extent the technology can evolve to provide higher levels of service in terms of speeds and support for new and advanced applications.

In Alaska, satellite services, whether termed "broadband" or not, should remain available and be made affordable, even to those without cash incomes, i.e., those living a subsistence lifestyle. In the long term even small, stable communities of remote citizens should be entitled to receive affordable terrestrial broadband, by means of microwave or fiber, dependent on geography and on how far they are

[9] Press Release, U.S. Department of Education, U.S. Department of Education Study Finds that Good Teaching can to consider, what metrics should be used to measure an effective balance of network, hardware, application development, training, and adoption? Please include comment on metrics, benchmarks, and results against benchmarks.

from other larger, well-established communities with high-speed points of presence (POPs).

Since terrestrial broadband solutions currently available are not both economical and physically possible statewide in Alaska, the national broadband plan may find that it is most economical to serve the most-widely-dispersed populations of Alaska by subsidizing satellite bandwidth services for the next decade or longer, as it currently does under E-Rate and RHC and perhaps with additional programs modeled after Link-Up and Life-Line Nevertheless, terrestrial broadband funding like that available through ARRA is available should never be entirely redirected from Alaska, even in areas where only satellite broadband access is available. Closing the broadband gap once and for all will require creative terrestrial solutions to take fiber and microwave connectivity to where no ISP has gone before.

When it comes to national averages, the 2008 *Statistical Abstracts of the United States*, Table 252, contains the following relevant data cited from a private source.[10]

Computers for Student Instruction in Elementary and Secondary, Schools: 2005−2006	**U.S.**
Students per computer	**3.9**
Schools with a wireless network (percent)	**54.2**
Schools with distance learning programs for students (percent)	**19.1**
Schools with laptop computers (percent)	**59.7**
Schools with high speed Internet access (percent) High speed =T1, T3, or cable modem	**84.3**
Schools with video streaming (percent)	**43.4**

[10] Source: Market Data Retrieval, Shelton, CT, unpublished data (copyright).

This data should be compared to the next table in the 2008 U.S. Statistical abstracts which indicates that as late as 2003, less than 50% of students were using computers at home even though 84.5% of the same group was using computers at school. Home use consisted of word processing, connecting to the Internet, or completing school assignments, all below 50% usage. The only home use above 50% was game playing.[11] Higher home use correlated to parental educational attainment and income.

Unfortunately, the current E-Rate program does not require the submission of data on the network connectivity achieved through the use of E-Rate funding; instead, since only the program applicants RFPs become public documents, the actual form that broadband deployment takes is only to be found in individual contracts with vendors, which are more often than not confidential documents. Other than national sampling by private parties or government agencies, the only way to systematically collect this information would be to require applicants to report the final form of Internet connectivity delivered, or to have them submit there technology plans – which should contain this type of information - for analysis by USAC or another government agency.

The best collection of current proposals regarding the state of network connectivity in Alaska and deployment projects that address connectivity, access, and adoption are in the possession of the National Technology Information Service as part of its ARRA BTOP program applications process. There are 29 proposals from Alaska for projects with a cumulative investment value of $1.3 billion, should they all be

[11] Table 253. Computer and Internet Use by Children and Adolescents: 2003 [For persons 5 to 17 years old As of September. Based on the Current Population Survey; see source and Appendix III for details]

funded. Unfortunately, these applications are not public either, not even in a redacted format, which also hinders statewide broadband deployment planning.

Currently, there is only limited publicly-available data on Alaska network connectivity and technology deployment projects that address connectivity, access and adoption. Here are the major sources of information:

- Regulatory Commission of Alaska Broadband Inventory (last updated 1/122007) http://rca.alaska.gov/RCAWeb/Documents/Broadband/Internet_connectivity-070112.pdf
- Gates Foundation Public Library Broadband Assessment Survey http://www.lrs.org/documents/public/broadband_2009.pdf
- 2009 National Survey of Public Library Computer and Internet Access http://www.plinternetsurvey.org/
- Akamai AK data http://fjallfoss.fcc.gov/ecfs2/document/view?id=7020243366

School District comments:

- Our district has 28 schools, all of which have access to the Internet. Location is western Alaska on the Bering Sea Coast. Size is 22,000 square miles, hostile climate with no roads. Travel between village schools is by air or snow machine. Some schools have 2 T1 lines in and some have 2 Mb, however, this is shared between Internet and video conferencing - typically on a 50:50 basis. Average school size is about 150 students with the largest being about 500 students. Most village schools are on microwave to the district office but connectivity between the school district to the Internet is via a 20 Mb satellite link which is shared between all sites and frequently at its maximum. Consequently access to the Internet can be very slow. (District A)
- *Current connectivity is severely limited due to the nature of our only option for transport - satellite connectivity with high latency is causing a divide that limits the options for rural students. (District C)*
- Our district has microwave based symmetrical 768kb connection to Internet at @ 3,000.00/mo. for 14 students & 6 staff; very expensive for such a skinny connection for few users. District B would be unable to have even this skinny connection except they are

a 90% e-rate school which comes out to about 300.00 month. Ping response rates run from about 20 ms to 200 ms total out and back, depending on distance from District B, which is fast compared to satellite technology which District B used to have. The speed of microwave technology is a definite advantage when running online web-based software compared to satellite which disallows some types of connections due to large latency times of 1600 ms total for the satellite. (District B)

b. Although kilobits/device, kilobits/classroom, kilobits/student and devices/student are metrics to consider, what metrics should be used to measure an effective balance of network, hardware, application development, training, and adoption? Please include comment on metrics, benchmarks, and results against benchmarks.

- Metrics like kilobits per student not a fair method of judging connectivity - all bandwidth is not equal - a T1 on fiber is capable of far more than a T1 on a satellite connection. (District C)
- *With the shrinking student populations in bush Alaska, the kilobits/device, classroom, and or students will not give a full picture. It costs as much to bring the bandwidth needed for video conferencing, streaming video, and other internet content to 120 students as it does for 200. (District E)*

c. What are the specific barriers to increased broadband deployment and usage for schools and libraries?

Cost is the primary and most significant barrier to increased broadband usage in schools and libraries within the State of Alaska. Without the Universal Service Fund (USF) support mechanism, no single school district or public library would be able to afford broadband connectivity. Even with USF support, the non-discounted share of broadband connectivity is a significant expense. Particularly for the smallest of our school districts and libraries, whose budgets have been deeply impacted by rising energy costs, the non-discounted share is preventing

some applicants from applying for the level of broadband that meets the needs of their local community. A list of barriers must include:

- Lack of school district and public library matching funds.
- Lack of affordable broadband, especially in rural communities and those served only by satellite.
- Lack of time and expertise to prepare a technology plan.
- The onerous and time-consuming nature of the E-Rate application process, especially for smaller public libraries.
- Staff turnover among those responsible for E-Rate applications.
- Lack of computer expertise and IT support.

An additional obstacle to broadband exists for libraries whose community wishes to have the broadest access to information possible and does not wish to filter their internet access. Currently under USF, all applicants must have a technology protection measure in place in order to receive discounts. If that technology protection measure is at odds with the philosophical view of the library, its board, and/or its patrons, that entity must pay the full price for all if its internet service. In a scenario such as this, which represents approximately one third of the libraries in the State of Alaska, the community has chosen unfettered access to information over connectivity speeds that can be considered broadband.

In Alaska we also have the problem of infrastructure costs which stand as a barrier to increased broadband deployment. It is not enough to bring broadband to the door of the school or library. Once there, it must be connected to a LAN that is capable of handling that connectivity. Many of our schools and libraries are not able to currently take advantage of Priority 2 funding which would assist with the

purchase of Internal Connections. Because of the high cost of travel to remote sites, a wiring project in rural Alaska can easily be three times the cost of the same project in urban America. For these reasons, the burden of providing the infrastructure necessary to take full advantage of broadband is also a significant barrier. We would encourage the Commission to consider program modifications that would allow more applicants the ability to access Priority 2 funding. We maintain that the Priority 1 funding should not be modified, as it reaches all of our schools and libraries, but we should suggest that the discount matrix be modified, and capped at a lower level, so that the funding could be spread over a larger portion of our applicants. We contend that an applicant with a 75% discount level has significant poverty in their local community and in all but year 2 of the program has been denied access to Priority 2 funding. By downwardly adjusting the discount matrix, you will significantly increase the availability of Priority 2 funding. We concede that this will require the higher discount levels to contribute more to their Internal Connections projects, but believe that in the long run it will encourage intentional and purposeful planning and spending that will reduce the potential for program abuse.

School District comments:

- Costs. Higher broadband speeds, at least in our district are expensive, even with E-Rate. We have looked at a 10MB connection which was quoted at $3,700.00 per month per site. We have seven sites, which would be $25,900.00 per month. We are currently using DSL connections (3MB). With DSL connections we still only receive approximately 2/3 of the speeds due to the DSL technology. (District F)
- *The current single most limiting barrier is the lack or terrestrial connectivity between rural Alaska and the rest of the world. (District C)*
- Costs are a major problem but right now even if we had the money the major barrier to increased bandwidth are the E-rate regulations. We are in year two of a three-year

contract and USAC says that to increase bandwidth we have to go out to bid (submit a form 470) even though doubling Internet bandwidth from the WAN to the Internet cloud would only be a 1.8% increase in the value of the contract. Obviously, going out to bid in the middle of an ISP contract is risking a court challenge that the school district cannot afford, so an increase in bandwidth seems out of the question. The second barrier is related to the geographical isolation and size of the school district in western Alaska. No copper or fiber to the Internet, only very expensive, slow and limited bandwidth satellite connectivity. The problem could be solved by undersea fiber up the Bering Sea coast, or even microwave from Bethel to Anchorage (400 miles) over the Alaska Range. (District A)

- *Cost is a chief factor, but also the speed of satellite means that no matter how wide the pipe, the water still takes 1200ms for a round trip. We need to run fiber up the waterways! (District K)*
- Cost, influenced by remoteness which precludes development of sturdy, beefy infrastructure that is available in urban centers. Also lack of curriculum in place to utilize connections effectively in educational purpose. Lack of staff development to recognize and use opportunities broadband technology offers. Many schools are suffering from decreasing revenue and resources and facing increasing costs for everything which forces hard and bitter choices as to what educational services must be pared down, stretched thin or dropped. Technology often times falls way down the list of priorities when making the bitter choices. (District B)
- *Satellite Internet limits connectivity speed for implementation of multiple online tools and necessary use of video teleconferencing which helps our remote area maintain courses taught by highly qualified teachers as required by state & federal mandates. (District H)*
- The cost of increased bandwidth for small rural schools, with small budgets and large expenses for utilities, maintenance, and qualified teachers, is a barrier to broadband deployment and usage. The wireless coverage for a building is not a problem. The monthly service charges with e-rate are affordable for our district with a high poverty rate and a 90% discount, but without that discount we would not be able to provide an internet connection for our students, much less the video conference classes for the smaller school in the district. Replacing worn and outdated equipment is impossible without grants and

we would not have been able to do the needed rewire of our LAN without the E-rate subsidy. Before the rewire some parts of the building had little or no coverage, now we are able to handle the increased usage by our One-to-One Program. (District E)

- *Barriers for increase broadband are definitely location of rural areas. Funding for hardware to allow the increase is also a big barrier. (District D)*
- Cost is the biggest factor as Alaska is hamstrung by location compared to the territorial circuits in the lower 48. We are lucky enough to be able to have some areas of fiber running up from Seattle but if you are not in locations that have copper or fiber access to the town then satellite-based internet might be the only option. Satellite-based internet is almost completely cost prohibitive as the amount of bandwidth can never achieve the needs of the community or the ISP is leveraging internet against transistor space. This in turn limits use during peak needs. It is great to say that bandwidth can be expanded when needed but when based on satellite space that becomes problematic. If teachers want to use the resources available but are limited by connection speed or bandwidth they stop using the resources. A 20Mbps down/868k up DSL connection in the lower 48 (Qwest for 52803 Zip) starts at $45 per month. Compare that to anyone in Alaska and see the price difference. That same circuit would cost a rural district millions. There is little incentive for the ISP's to upgrade from satellite service. (District G)
- *One of the barriers is the requirement for network equipment upgrades to support higher speeds and/or communication service provider outside plant upgrades. When school sites have increased speeds then there is higher demand on total backbone network links thus requiring increased speeds there with associated equipment upgrades. (District J)*

Is lack of physical facilities, including, e.g., complete wireless coverage for a school district, a problem for some schools and libraries?

Yes, lack of physical facilities is a big problem and, probably because of this lack, more and more libraries must add wireless access to their buildings to increase public access, though usually at *slower* speeds due to the increased network use of

the limited bandwidth that is affordable; of Alaska's 115 public libraries and branches, over 40% have deployed wireless to date.

Small rural libraries do not have adequate physical space for the additional public access terminals they need. They are increasingly acquiring laptops that patrons can check out for use in the library with the library's wireless network. They do not necessarily have the needed physical wiring or the funds necessary for the increased costs in electricity and heating that an expanded facility would require. For many libraries this is why they do not have extensive hours of opening in the winter.

A coordinated program providing alternative energy sources to schools and libraries implementing broadband deployments might help to meet these needs and at the same time environmental sustainability goals.

School District comments:

- That has not been case thankfully due to the lower costs of wireless coverage but it does not mean that facilities and wireless coverage are not important. With the availability of cheap line wireless routers and the move toward laptops in education it has made wireless necessary but it is something that schools can configure internally on a need basis. Costs are reasonable helps in the planning too. Facilities that are pre-internet can be moved into the current generation quickly. (We have 2 50+ year old school buildings with wireless) (District G)
- *Well certainly, because many buildings are old and not wired or not wired adequately for modern speeds. Wireless coverage is an easy way solve this problem but brings a different set of problems such uneven coverage, interference, slow connections, management, maintenance and security which all cost time and money to address. (District B)*

- The poor quality of the wireless configuration in our schools combined with the increased student and teacher use of wireless has greatly affected our ability to connect to our SIS and provide reliable online integrated technology for teaching and learning. (District H)
- *Local area wireless is cheap and easy to install, wide area wireless is a bit more difficult, the real issues in my mind are access to the Internet (District K)*

Is cost of the monthly service or installation too expensive, even with the E-rate discounts?

Yes, these are both problems. Installation costs are a major barrier to broadband deployment, especially as most installation fees and non-recurring costs are not covered by the E-Rate program. As for monthly costs, all libraries in Alaska limit the bandwidth to which they subscribe because of unpredictable data surcharges that broadband services invariably charge, i.e., additional fees or bit rates once a specified download threshold has been reached. These data throughput charges can quickly increase monthly bills by three-fold. Worse, they make fixe monthly Internet subscription pricing impossible.

Predictable connectivity costs are extremely difficult for small libraries to maintain. These anchor institutions are often unable to stay within there budgets, especially when tourist patrons dramatically and unpredictably increase both data downloading and uploading (primarily of vacation photos). Smaller libraries have no networked means of controlling data throughput by individual patrons without constant monitoring, which is impractical. Even larger, networked libraries have difficulty in limiting data throughput on individual sessions and prefer not to invoke any limits on patron user of the Internet other than the length of a session when others are waiting.

School District comments:

- See the first comment about cost in rural areas in Alaska. Travel and remote locations add very large costs to both of these factors. In the Aleutians for a technician to come in from Anchorage was at least a three day proposition. The ISP's have to put that in their bids which in turn increase costs. Without E-Rate discounts both would be almost impossible for schools to handle. Even with the discounts at times it is difficult. (District G)
- *Without E-Rate it would be impossible. With E-Rate it's bearable but for a school pretty much any cost is too much (District K)*
- Costs are too expensive at this time, especially at speeds greater than 6MB. DSL technology to allow for full speeds is not yet available here. For example, with a 3MB connection 20% is lost to overhead. Our provider is looking at a new technology that would allow us to receive the full speed, but at this time (District F)
- *Our district has as good Internet service provider as there is but consider that, even after very expensive (2k -3k monthly) multi-year contracts which have long since paid for the cost of building the infrastructure, cost don't go down as you would expect after paying for the equipment – the costs just go up. This is not exactly right when considering we are trying to educate our population with the best methods for the future of our country. As mentioned, most schools struggle for money and resources; any costs are problematic as they force hard choices about priorities. (District B)*
- Yes, skyrocketing fuel costs for heating and transportation of goods to our rural Alaskan areas eat in to our budgets for every area even though student numbers are low we must still provide these services for our students. (District H)
- *Costs for our district even with e-rate are almost unmanageable. (District I)*

Is funding for services and equipment not supported by E-rate, such as computers or teacher and staff training, too expensive for schools and libraries to purchase additional bandwidth?

Yes, as indicated above, both schools and libraries in Alaska face budget cutbacks because of the national recession and for these reasons among other, these anchor institutions find computers and teacher or staff training so expensive to acquire,

implement and/or maintain that they act as a disincentive when it comes to a greater investment in broadband deployment, whether under the E-Rate program or not.

School District comments:

- Extra services and equipment can sometimes be costly and always factor into the choices schools make about priorities because they do detract funds from the budget. If funds go into equipment and staff development, the budget must be balanced with money from somewhere else and in education it seems there is never enough money to go around. Any extra costs, including services and equipment not funded by e-rate, are always a challenge for schools (District B)
- *Yes, they are currently insufficient. We are currently waiting on erate approval for upgrades to our wireless infrastructure so our current insufficient routers will be upgraded to provide the increased level of connectivity we need for the increasingly complex applications we are using to provide learning and communication tools or services. Other issues interfering with upgrades in our specific location relate to the qualifying erate percent, which doesn't take in to consideration the complex nature of getting materials and qualified installation personnel and services to our remote location in the Alaskan bush. Our small school population and limited teachers on site means these outside resources are critical for providing our rural minority students with connection to outside teaching resources to increase the quality of instruction and level the playing field for them to attain the educational opportunities of their peers in the lower 48. (District H)*
- We do not qualify under E-rate for anything other than basic services. We only have two schools with a National Lunch Program. With seven sites, this does not help our E-rate funding. We have sent out surveys, but to date, many are not returned due to the fact that parents do not wish to report their wages, even though we emphasize that this is confidential information. *(District F)*

Are internal networks insufficient to handle increased usage?

- Our internal network is capable of handling increased usage. We are currently upgrading our wireless access points to accommodate a greater wireless load. (District F)
- *We have more than enough. Our internal networks could handle the added capacity for many times over what we can afford. The limiting factor is "outside bandwidth" as equipment ages the replacements have much higher capacity then the increases that occur in bandwidth. (District G)*
- Individual LANs and the district WAN can handle the work. The bottleneck is our connection to the Internet. (District A)
- *Internal networks are sufficient for current usage of Internet connections and capable of handling any conceivable increase in Internet connection. Most equipment is connected at 100mb speeds with a few oldsters at 10mb and our Internet connection is 768kb, about ¾ of a mb, so our bottleneck, when we experience one, seems to be the Internet connection. (District B)*
- Most of the internal networks I've seen are OK. Even at megabit speeds they're sufficient for most school work. Aside from Internet connectivity, another pressing problem is server configurations that allow for proper administration and every day use. (District K)
- *Our internal network is capable of handling increased usage. We are currently upgrading our wireless access points to accommodate a greater wireless load. (District F)*

BROADBAND IMPLEMENTATION

2. We seek comment on school and school system broadband initiatives including infrastructure and large-scale application deployment.

There are many outstanding broadband initiatives in Alaska. Here are one at the district and another at the community level:

(1) Broadband is critical to providing Bering Strait School District (Alaska) students with the same high quality education opportunities as non-rural communities. BSSD is located in coastal northwest Alaska covering an area of approximately 80,000 square miles, with fifteen schools and about 1,800 students. BSSD utilized SchoolAccess, a high-speed satellite network that provides basic connectivity, managed services, and videoconferencing. SchoolAccess was created to allow rural communities to access broadband connections over satellite through E-Rate funding. Today, BSSD has 3 Mbps connections from each school to the district office in Unalakleet that are heavily relied upon to create a coherent sense of community throughout the district, provide educational opportunities to students, and allow teachers and administrators to meet without having to fly between communities.

(2) DeltaNet is a successful community model bringing low latency, high-speed broadband access to school districts, health clinics, and the communities of the Yukon Kuskokwim Delta area in Southwestern Alaska. DeltaNet created the equivalent of a terrestrial broadband network, connecting remote communities together via an infrastructure that include microwave and fiber technology. The

network reaches all 30 schools in 5 school districts, over 50 health clinics, government facilities, and residences through 42 communities.

a. What projects have been considered successful and not successful? What were the success criteria?

- Our bandwidth speed in rural Alaska has not been able to keep up due to location and the limits of Satellite connections in general to that provided to the students in the continental U.S. Our SIS has had connectivity issues synching grades over the Internet from its inception in 2001 and continues to have connectivity issues in the present web-based version. It is not a SIS issue, it is a connectivity issue. We are currently utilizing the web-based version, which is an amazing tool for us considering our district's geographic size and the lack of having a road. For everyone using this tool, it is vital to be able to see student achievement and data at the click of a mouse. However, teachers continue to have time delays slowing productivity when navigating their grade book portion due to connectivity issues. Success of this tool however can be seen in the increasing connectivity statistics by students and parents through the parent portal in communicating with parents on their children's achievement. (District H)
- *Monies were set aside to increase bandwidth during the last funding cycle from the general fund and technology was recognized as a "necessary tool in the education of students". The criterion was a recognizable increase of technology use in the classroom as an integral part of instruction. We saw an instant increase of bandwidth use and a palatable excitement in the halls with what teacher now had the ability to do. We saw a large push for advanced technology and laptops. (District G)*
- Our Intensive Reading Intervention program utilizing VTC as our connection tool throughout the district by our 3 program teachers has continued to increase in use over the last three years. Success in the use of this tool can be seen with a combination of other tools we use to measure student growth in reading such as the STAR reading assessment and over all reading statistics seen through our AR data portal on reading participation and success rate along with the increase in students either attaining proficient or large gains from their previous SBA scores. (District H)

- *Distance Learning using videoconferencing has been highly successful and terms of student achievement. Sites that do not have a highly qualified teachers use video conferencing hosted at the district office. Courses taught include Algebra, Math, Geometry, various science courses, Art, Robotics and more. VTC is also used extensively for professional development and saves considerably on airfares, per diem and accommodation costs of bringing staff into the district office. We have two video conferencing systems into each school. Success criterion is student achievement in terms of assessment and AYP. (District A)*
- For the new Student Information System the initial success has been that it was operational as planned for the start of the school year. As the year progresses, new features and functionality will provide additional benefits to the educational community. Having better communication options between teachers, students, and parents/guardians will ultimately improve student achievement (District J)
- *The success criteria are informal observation of students using Internet educational opportunities otherwise unavailable with no appreciable negative impact on performance. Getting 90% E-Rate funding has been successful in getting connected at 768kb which cost 3,000.00 a month with the district's share 300/month which is all we can afford at this point. Our district does not qualify for NCLB funding to purchase technology and many times is viewed as too small, 14 students, to qualify for other grants and special funding. (District B)*

b. What have been the barriers to entry and barriers to adoption?

The primary barrier to entry and adoption of broadband infrastructure and application initiatives in Alaska has been lack of funding. Apart from the Regulatory Commission of Alaska's Rural Alaska Broadband Internet Access Grant Program,[12] the initiatives that have been undertaken are generally at the local level.

[12] Regulatory Commission of Alaska website at: http://www.commerce.state.ak.us/dca/edrg/EDRG_BrowsePage_Template.cfm?Program_Name=Rural+Alaska+Broadband+Internet+Access+Grant+Program

- There are lots of barriers but one of the biggest is lack of adequate funding. Looking at the benefits technology initiatives bring to education, they often seem like simple no-brainer decisions to everyone but when examined in detail and every nickel and dime is added up they can come with a hefty price tag called "total cost of ownership" which make administrators balk and politicians backpedal. Also, small schools and even some larger ones cannot afford and don't have specified technology people to go after grants and ultimately implement and maintain the technology so they have to accept less service than they otherwise might have. In some schools many things have to be shouldered by teachers who already wear too many hats. The fact that much of the money is offered with complicating and bewildering hoops to jump through is evidence of people justifying their jobs and the funding could and should be streamlined to be more easily attainable and can be done without additional risk of misuse. (District B)
- *Cost of building out the infrastructure into areas with widely dispersed, economically disadvantaged, small populations (District C)*
- Professional Development is always an entry and a barrier when too little is done or too few preparations are made. Adoption has slowly become accepted by even the most stubborn teachers because of the increased use of web applications in the backend. Online grade books, lesson plans only accepted electronically, online professional development, as well as some mandated trainings from the state are only available online. (District G)
- *Initially trying to work with five operating systems, many having lack of wireless for teachers, or lack of mobility (desktops in classrooms, not a lab, or laptop) to train in one location or remotely to groups of teachers was a major issue in teachers adopting technology. This year, all teachers received a laptop with one platform, which allows me to be able to remote in easier, shoot out applications or licenses to multiple machines remotely, and do "just in time" trouble shooting and training for staff and students in the 1:1 AASB-CDL initiative in Alaska. New teaching and learning tools adopted this year to help build our students' background knowledge and increase technology skills for our younger students or just in time lessons for our older students and staff have been met with enthusiasm by teachers and students until slow connectivity due to increased bandwidth needs required juggling schedules and VTC course times to make them work*

properly. These workarounds impede adoption of these tools and frustrates teachers and students. (District H)

- Lack of sufficient bandwidth is a huge barrier for distance learning via the Internet. Students are enrolled in online classes but often cannot get on the Internet or it is very slow and they cannot do what they are trying to do. Sometimes maybe only 5 students in a class of 15 can get online. Internal connectivity function has been a problem in that site switches etc may go down or get fried because of bad village power and dust even though all are protected by UPSs. Physical wiring including wall jacks also suffers from wear and tear. This problem is being addressed with a $1 million basic maintenance contract which has not yet been approved by E-rate. (District A)

c. What are the most common needs heard from classrooms and instructional leaders with regard to using broadband for instructional or other purposes?

- Once again a lot of things are heard: more and better computers; bigger and faster connections; access with fewer filtering restrictions; more staff development; ancillary equipment like digital projectors & network printers; e-mail for students; and the desire to try new software packages and technical help to implement them. (District B)
- *More bandwidth!!!!! More dependable services in rural areas that have environmental (snow on the dish) and power issues (city power disruptions). Newer equipment is always a need. (District G)*
- Many tools require streaming Internet for live feeds during presentations of CNN broadcasts for instance teachers may be using as a teaching tool in the classroom. These come across garbled or get dropped at key times and have to be continuously reconnected to throughout the presentations. Teachers also have to notify others in the building that they will be using this tool so others virtually stop what they are doing Internet wise for the broadcast to come through. Our teachers are connecting live with students in the lower 48 and abroad on an increasing basis, as global communication becomes increasingly available as a real life learning tools for gaining 21st Century Skills. Many students across the world have heard of the Iditarod dog sled race and our schools get many requests to connect with them to learn about the mushers and the culture of our

area. The relationships and comparisons of the two collaborating locations are made months prior to the actual race increasing our students' awareness of the other locations in the world. It is an amazing fact that we are able to connect at all, but now that teachers know this is possible it is being utilized more and more frequently through Skype by even our least tech savvy teachers due to its ease of use compared to setting up VTC connections though our ISP. VTC is also utilized daily for teaching throughout the district as well as in partnership with universities and Career Educational Opportunity courses in our district. (District H)

- *The need to upgrade bandwidth to allow for access and usability of streaming media (District C)*
- The most common needs of our classrooms and instructional leaders have been for more bandwidth, which we won't be able to have unless fiber cable is made available in our area. The satellite connection we currently have is a bottleneck that we can't overcome. (District E)
- *Most common comment – need faster access. "Too slow to do what I would like to accomplish in class" (District F)*
- More bandwidth - better Internet access. LAN issues such as slow internal connections. The latter is being addressed by a new basic maintenance of internal connections contract. (District A)
- *Consistent broadband throughout the building. Also, knowing how to use it -- training. (District D)*
- They need and want faster response times and more bandwidth as more applications are centralized or Internet driven. (District J)

d. What creates demand for using broadband in education?

While the ability to access web based learning sites and to participate in and learn from real time broadcasts around the globe *should be* reason enough for schools and communities to achieve broadband capability, here in Alaska we have an

additional challenge: providing our secondary students with quality college preparatory coursework while allowing them to live at home during their high school career.

It is a challenge in villages, which often have a single K-12 school that delivers instruction to 20-50 students, to have the staff available to offer the scope of instruction we take for granted in our urban sites. Situations such as these leave a staff of only a few to teach our students. Without the availability of interactive video, our secondary students would be left without a choice of advanced coursework. In the past this situation has meant the difference between choosing whether to remain at home with family for high school or to move to a larger area for your high school years. In urban areas, there is often the pressure from parents who are aware of the gap between school access and home access. However, in rural areas, particularly in homes without Internet access, there is little external pressure on schools because, however slow the speeds, they are better than what students can achieve at home.

An example of this can be found in our Pribilof Island School District. There are two main islands in this district and, until the availability of distance delivery via broadband connectivity, all of the high school students on St. George Island had to leave their homes to live on the larger St. Paul Island *if they wanted to graduate from high school.* We celebrate that broadband has brought communities such as these St. George the opportunity to retain their young people while affording them the quality of education available to their peers in more populated areas.

School District comments:

- Teachers trying to access web based learning sites for their students. Our geographic isolation and small schools on very limited budgets mean that often there are no "highly qualified" teachers. Consequently they turn to the web more and more even though they know that often they cannot access sites. The demand is growing constantly. (District A)
- *This can be a big list but some are: online educational resources like courses, textbooks, curriculum planning, data analysis, networking of professionals, access to other students, schools & universities. (District K)*
- Teacher comfort level with technology and their increasing awareness of supplemental educational resources to use in their teaching to interest, motivate, and empower their students has created increased demand for broadband. Our students in rural Alaska are not exposed to as many outside influences or learning experiences as students in the lower 48 or even as more populated areas of Alaska have, so much of what they know of the world "outside" comes from the Internet, which schools use to provide a learning experience or TV, which is in homes and is not usually used as a learning experience. As the state and federal requirements for learning and achievement increase, but our population in rural Alaska does not, our needs for remote access to teachers for subjects we are unable to provide rigorous courses for increases. This also creates increased demand for QUALITY broadband. (District H)
- *Endless educational opportunities for students: Virtual field trips, online discussions, etc. (District F)*
- The cost and ease of using videos and other resources found on the internet is a big factor in the demand for using broadband. Another demand is for interactive exchanges with other schools and interactive field trips via video conference. These are invaluable to isolated rural communities in Alaska. The access to quality higher level courses taught by highly qualifies teachers is another demand for using broadband in education, especially in rural communities with limited staff. (District E)
- *Changes in opportunity - there are a whole host of new on-demand, streaming media and high definition videoconferencing options for the delivery of content (District C)*
- Student driven-decisions are the biggest factors. Students come into the school and want to use the information or skills that they have acquired and push innovation. "I want you

to do a PowerPoint" is different from "I want you to do a presentation." When student innovation is recognized in one classroom it pushes into other teachers and other classes this in turn pushes for more resources. New teachers are also a big push. Our recent graduates are coming from education programs that are sometimes entirely online or they have been on campuses with little limitation on internet access. Then they move into a high poverty area in rural Alaska and are extremely limited in what they can do and share with students. They create a constant drive for more tools and access. The amount of information available on the internet is astounding and it is only useful when teachers and students can access it. (District G)

- *Online curriculum and media rich instruction (District D)*
- Online digital content with greater richness of video, pictures, and audio materials require larger broadband communication networks to provide a usable level of responsiveness. (District J)
- *Media rich content from education internet service providers and online learning environments. (District B)*

BROADBAND AND DIGITAL CONTENT

3. We seek comment on schools' and school systems' online and digital content needs and uses, including content for student instruction (e.g., whole or partial textbooks or supplemental resources) as well as professional development content for educators.

The State of Alaska supports the full availability of broadband to allow access to the growing expansion of digital content available to our schools. Digital content is used for both student instruction and professional development for educators. EED provides all the mandated and required trainings to all educators in the state through e-learning modules. Districts are provided access to online formative assessment resources and tools to help them differentiate instruction. Districts provide access to a variety of free and purchased digital content solutions to reach their students with special needs, extenuating circumstances, and need of intensive remediation.

Online content is still in a state of transition as are educators. Often online content is mimicking traditional textbook delivery of information and instruction, which is what most teachers know and trust. Online content needs to mature and become more dynamic to provide real time feed back with data input and interpretation. Professional development is critical. Educators need to learn how to set up and take advantage of dynamic learning environments.

Integration of digital content and traditional media is a transitional step in moving to a fully 21st century classroom and may be a barrier in itself. Teachers attempting to integrate these tools often find that technology becomes complementary to the traditional model as opposed to transfiguring. This can

become a permanent stopping point on the road to meaningful transition. The lack of mature online tool sets for developing classroom activities, as well as a lack of trust in the available infrastructure, combines to create a difficult stumbling block.

In Alaska, bandwidth and latency issues create concerns with online tools that are not present in most communities. Media rich solutions that would be embraced by teachers and students put tremendous pressure on limited infrastructures that were not designed to handle load introduced by those tools. In assessing needs for bandwidth, IT professionals need to focus on the requirements that will present themselves in the near future (3-5 year timeframe) as opposed to concentrating on the needs they can identify today. When infrastructure fails during class time, instructional staff looses trust in the solution and will fall back to traditional resources.

a. What sets of instructional and operational problems are schools and school systems attempting to solve with online content solutions?

- Provide alternative learning environments for students with special needs and extenuating circumstances. Provide authentic learning opportunities with real time feedback and performance results. Provide online learning opportunities for credit recovery, advanced placement courses and learning opportunities that may not otherwise be available in a give school district. Provide professional development opportunities for district staff. Increase utilization of dynamic resources and course content materials as apposed to traditional textbooks. (District L)
- *As the state and federal requirements for learning increase, but our population in rural Alaska does not, our needs for remote access to teachers for subjects we are unable to provide rigorous courses for increases. (District K)*
- Live events became a norm where students could watch history happen rather than just hear about it. September 11th became an internet event much the same way that people

left TV's on during the Challenger Disaster. Twitter gave us instant events in the Iran election. Electronic monitoring of school events, calendars, websites, and emergencies are essential to a school district I really don't know what we would do as teachers with the loss of communication and resources. Online classes and textbooks are also more readily available for less cost which brings in new and more diversified instruction. (District G)

- *With limited resources, our district is struggling to provide core content as well as differential learning levels and hopes to find appropriate and reasonable online resources to fill those needs. (District B)*
- Credit recovery, but also the ability to provide more rigorous courses for students unavailable onsite due to limited teaching staff in our rural area. Ability to gather data in content areas by using online learning tools for better reflective teaching practices and providing administration with the ability to get a better picture of what is happening daily in our schools. We do provide a learning management system for our staff and students in technology to better gauge what is being used, as well as to help us get benchmarks on 21st century tech literacy skills. (District H)
- *Supplemental math programs (Carnegie Math), Learn360 videos for classroom content, (District D)*
- Schools in remote areas with small student bodies and limited staff need access to online and distance education which is more often than not delivered via the internet. Without this ability to access the advanced and specialized courses available online many students would be unprepared for post secondary education and would have the added expense of remedial course they would need to start a program of study that would help them become productive members of society. Professional development opportunities are very limited or non-existent in remote schools unless broadband internet access is available to access online distant education courses. (District E)
- Need for greater variety in offerings, need for remediation, need for advanced placement and post-secondary *preparation options for students and professional development for staff (District C)*

- Our district has numerous instructional and operational challenges that we are addressing with online content solutions, including the following:
    - Students who are not proficient in reading, writing, or mathematics receive intensive remediation through customized online curriculum
    - Students needing credit recovery for courses they did not initially pass have the opportunity to earn credit by attending an online learning lab and progressing at their own pace through the curriculum; and
    - Due to our highly diverse population, English Language Learners and students with special needs benefit from a wide variety of network-based applications that differentiate instruction (District J)
- *Meet the needs of our above proficient students. Continue to provide a viable curriculum with a decreasing school population. (Less students, less monies, less teachers, less curriculum – a negative feedback loop) (District F)*

b. Of the typical set of online content tools (e.g,: content creation, content publishing, content indexing, content management, content search) what have schools and school districts experienced when making purchasing decisions about the quality and availability of tools that meet their needs?

- Because of our 700-millisecond latency with online resources we have to assess the service to see if the end user has a timely and successful learning and end user experience. The user's experience will be dependent upon the kinds of content the online resource is providing. In some cases the service can be replicated locally. This increases our overall costs. (District M)
- *Budget constraints limit amount of online content tools we can use. Credit recovery is a priority for us. (District F)*
- There are so many offerings available that it can be difficult to make wise choices. Salesmen promise the world and too often fail to deliver. It can be costly and wasteful to learn by trial and error which tools are effective and helpful and which tool are not so good. Generally, peer discussions with other educators are helpful in finding and using

good tools. Educator targeted magazines and reports are helpful in bringing good tools and trends which have worked well for others to the attention of educators. It would be helpful to have an educator clearing house of solutions and products to turn to for advice and help – OETC is an example of this type of educator organization and perhaps Alaska could do something along this line. Also, online experiences and capabilities are very different between urban and remote locations because remote locations generally don't have the big data pipes and that really limits their choices of online services to ones that can be run through skinny connections. Because of our 700 millisecond latency with online resources we have to assess the service to see if the end user has a timely and successful learning experience. The user's experience will be dependent upon the kinds of content the online resource is providing. In some cases the service can be replicated locally, but this increases our overall costs. (District B)

Are there areas where needs are consistently unmet or under-served?

- There is a tendency to see media literacy skills not fully developed. IT staffs trying to support delivery of educational content tend to be underfunded and overworked although this is probably not where this should be listed. (District B)
- *Bandwidth (District A)*

c. How is digital content being integrated with traditional textbooks and other materials? Are there issues preventing this integration?

- Lots of ways this happens and it seems to be as varied as the educators' level of tech savvy. Multimedia & video clips seem popular but are severely hindered by skinny connections. There are innumerable canned and web-based educational software available and helpful but, here again, their delivery is hindered by skinny connections. Many teachers are not tech savvy and almost no digital content is delivered in their classrooms and in many cases and subjects this is acceptable. However, in light of the

fact that the world is "going digital" at an increasing rate, digital content is helpful and another tool in the teachers arsenal in engaging students and keeping them engaged as well as providing and expanding educational opportunities otherwise unavailable. A bigger effort should be made at staff development in using and teaching technology skills and also in hiring teachers that are tech savvy. Curriculum needs to be updated for inclusion of new technology and digital content where useful and appropriate. (District B)

- *We have just begun using online textbooks, and probably due to our small class sizes have not had issues with our classes accessing them. Our smaller sites are piloting online textbook use. (District H)*
- Several teachers wish to use online sources to add to their lessons, yet we all try at once to reach a site, we do not have the bandwidth to allow for this, thus frustrating teachers, students and staff. (District F)
- *Moodle and other open source software options are being used to enrich both online and regular classroom instruction. (District C)*
- Teacher professional development is aimed at this issue which is another videoconferencing use. We also have two specialized, full-time, certified teachers travelling from school to school constantly and integration of technology into the curriculum is their major focus. (District A)
- *Old text books with new content would be the main issue. Some of the new textbooks have a web interface that is nice for supplemental and test preparation. (District D)*
- Digital content is rapidly emerging as one of the most critical factors in every curriculum area. Every curriculum adoption now includes digital content as a critical component, and many areas are scaling back on textbook purchases. However, our network infrastructure and bandwidth limitations do not currently allow us to rely solely on digital curricular resources, and we would need a much higher number of student computers to make this transition entirely. (District J)

DIGITAL LITERACY

4. We seek comment on digital literacy programs, standards, and content.

The State of Alaska, in partnership with the Alaska Association of School Boards (AASB) has embarked on a project, beginning in 2006, entitled the Consortium for Digital Learning. This is a program designed to provide students and educators equitable access to digital resources by providing a ubiquitous laptop access 24/7.

> "CDL initiatives have now been successfully established in 28 of 53 school districts statewide. Today over 12,000 students in nearly 100 schools are experiencing education with a laptop computer and Internet access at their fingertips. Launching a statewide digital learning initiative has involved the development and coordination of numerous interrelated components designed to maximize the success of each four-year project and to hold districts accountable for meeting set goals."

As a result, schools engaged in this initiative have typically doubled their need for bandwidth as a result of this program and students are rapidly becoming the digital citizens that we had hoped for. The barrier to this positive program is that, once the school day ends, these students go home to little or no internet connectivity. The school is often the only place in the village where anything approaching true bandwidth exists. There are no internet cafes in the rural settings we describe.

Access to digital resources 24/7 allows students and teachers the opportunity to collaborate and learn any time and any place. Educational programs that provide 24/7 access to digital learning resources need 24/7 connectivity. Acceptable Use

Policies need to be developed that are compatible for student use in all educational environments, especially for those traveling students that participate in school sponsored extra curricular activities. This would include nontraditional learning environments such as national parks, museums, vocational tech centers, and other class field trip sites.

We suggest that the FCC consider expanding their definition of "eligible purpose" with respect to small communities where there is no other location for connectivity open to the public. If a community of less than perhaps 1,000 people, which lacks a public library with broadband connectivity, were allowed to share their school's bandwidth available after hours with the local community, one barrier to implementation of projects such as our "1 to 1" initiative would be significantly reduced.

a. Please provide case studies or data relating to the use of digital literacy training to improve access and use of online systems, and the educational, social or economic impact created by such work. Where has such digital literacy work been accomplished in a traditional classroom and where has it been accomplished in an online or blended model for developing these skills?

- The district's Library Coordinator offers several credit classes for librarians and other teachers including *Raven About Web 2.0*, which is an entirely asynchronous online exploration of Web 2.0 tools with an emphasis on how to integrate them into instruction. The *Technology Infused Learning* credit class for district librarians was held in Second Life, a synchronous online virtual community, and traditional face-to-face environments. The focus on the *Technology Infused Learning* class was to define meaningful technology integration for students and how librarians could help achieve that within their buildings. (District J)

- *Digital literacy is on-going in all classrooms and all subjects and courses – it is not a special topic, it is integrated into the curriculum. (District A)*
- Digital literacy programs offer students greater flexibility for learning. Blogs, Wikis and cloud computing environments provide students the ability to complete assignments and participate in learning environments that go beyond the classroom and the typical instructional day. These resources allow student to manage their time and tasks in authentic ways. (District L)

What physical locations (if any) were used (libraries, schools, etc.)?

- One major purpose of the program was to extend the classroom beyond these physical limitations. The tool allowed for learning to take place in the logical location for the content being addressed, such as Denali National Park for geology and the Sea Life Center in Seward for biology. (District L)
- *All schools but more so in our 16 one to one laptop schools (District A)*
- High school library for the *Technology Infused Learning* class described above (District J)

b. What barriers or issues have prevented implementation of such solutions?

- Sufficient access to materials and media due to lack of terrestrial network (District C)

ONLINE LEARNING SYSTEMS

5. We seek comment on online learning systems.

The State of Alaska is unique in that often online learning opportunities may be the only way to provide student access to "highly qualified" teachers. Over 40% of our core academic classes remain taught by not "highly qualified" teachers in schools of less than 200 students. In many cases, supplemental services required for students under NCLB are only available via distance.

Online learning allows schools to provide beyond the core to include advanced placement, foreign languages and other learning opportunities not available locally. Some districts have been able to offer career and technical education certification programs. Online test preparation and career development resources has been used through the state library's digital pipeline, as well as various research resources that are made available to all Alaskans.

All districts in Alaska support some form of blended online/offline instructional delivery, distance learning and computer-based learning to meet the needs of their students. Some districts use synchronous videoconference to provide instruction from the district office to multiple sites, as well as from remote sites to other remote sites. A few districts provide full online delivery of courses from a centralized location to students throughout the state. Other districts often enroll students in courses delivered from outside Alaska. All districts are responsible to ensure the courses are aligned to the Alaska State Content and Performance Standards for students.

The effectiveness of online, blended, and off-line systems are measured primarily the same as traditional face to face delivery as growth in student achievement. Although other factors such as completion, drop-out and graduation rates are often considered as these options are often used for alternative education opportunities. As online and blended learning becomes more available to all students then consideration of teacher, parent and student needs will become larger factors.

EED is in the process of considering a statewide virtual school program. The program would be a collaborative effort between districts allowing them to share their "high-qualified" teachers, as well as curriculum that is culturally sensitive. One of the biggest issues to consider will be the infrastructure and broadband in place to allow these opportunities to be available to all students.

a. Please provide examples of schools and school systems currently supporting blended online/offline instructional planning and delivery as well as distance learning via broadband and computer-based learning. What online content systems (e.g, online text books, resource libraries, learning management systems (LMS), distance learning programs, student portfolio systems) have been successfully implemented?

- Our district uses Carnegie Math; Lets go Learn; Rosetta Stone Italian and Spanish languages; online classes from University of Alaska in math, social studies, English & sciences. Students can and have become Microsoft Office User Specialist certified. Online test preparation for all the standardized tests like SAT, HSGQE, PRAXIS, etc. Various career planning programs like AKCIS & Alaska Advantage Programs. Videoconferencing is used for CEO/CIS as well as meetings and an occasional virtual field trip (District B).
- *Our district uses too many to itemize as this would be a study on its own. District office (DO) is unaware of all school online activities. The DO is aware that we do not provide sufficient bandwidth and hardware for all activities because we get complaints from*

schools when they cannot do what they need to do. Demand for online teaching and learning activities is growing exponentially – or so it seems. (District A)

- Our district has prioritized the expansion of online learning systems for the past several years. Every teacher and student currently has access to Moodle and we anticipate that many teachers will soon be utilizing blended instruction by supplementing their traditional courses with online instruction. We have one credit course that we have developed and delivered independently, and we have numerous high school courses in all content areas and at all instructional levels (including Advanced Placement) that are delivered using Apex or Florida Virtual curriculum. We anticipate that growth in this area will be rapid, perhaps as high as 30% per year. (District J)
- *Alaska Learning Labs, Compass, Renaissance Place and Achieve 3000. (District M)*

How do schools and school systems align online learning systems with other traditional instructional tools (e.g., textbooks, curriculum, scope and sequence)?

- Many online educational systems and resources are already aligned with Alaska State Standards and Grade Level Expectations or can be brought into alignment with minimal modifications. Our district seeks those already in alignment or, if there are gaps, supplements with other resources. (District B)
- *Our district is currently working on our curriculum and hopefully this will be included. (District F)*
- Our district focuses on ensuring that all materials curricular resources (regardless of their origin) align with the district's content and performance standards. (District J)

b. How do schools and school systems measure the effectiveness of online vs. blended vs. offline instruction?

- Teacher evaluation, however, our teacher evaluation tool is outdated and work is beginning to take place to address teacher evaluation. Evaluation will have a strong component on teacher effectiveness-at least that is our goal. (District F)
- *Frequent student testing – we use a phase system which requires frequent testing. (District A)*
- At this time, effectiveness is by teacher and student feedback. This data is also included in the NETDAY speak up that is currently happening where we can get results specific to our district and by school in comparison with the Nation. (District H)
- *Informal observation and data collected annually as well as being responsive to students' needs and parent concerns. (District B)*
- Our district analysis student scores on standardized tests, course completion rates, and high school drop-out and graduation rates. In addition we are beginning a process of surveying all students taking online courses through our district. (District J)

What are the benchmarks used to compare delivery approaches?

- Again – frequent testing. But, also absenteeism, disciplinary issues per time period, drop out rates etc. (District A)
- *Cost and Time (District H)*

***c. What barriers or issues have prevented implementation of such solutions*?**

- Cost and time. A district doesn't just want to dive in and spend money on something untested, but can't really know how well it will go over in the classroom until they put it into practice. The catch 22 leads many to simply fall back on tried and true methods. (District K)
- Internet bandwidth continues to be our biggest barrier—we are always cautious about implementing any curriculum which is too bandwidth intensive. (District J)

ACCOUNTABILITY AND REPORTING SYSTEMS

6. We seek comment on schools and school system implementation of online/ASP/cloud-based student instructional data reporting systems and their impact on student achievement and school operations.

The Alaska Department of Education & Early Development is undertaking streamlining data acquisition, reporting and analysis to support data driven decision making. The Unity Project, the state longitudinal data system (SLDS), aim is to provide the department and its stakeholders with a single authoritative data structure for education data in Alaska. The SLDS was initially funded by a $3.5 million federal grant from the Institute of Education Sciences, the research arm of the U.S. Department of Education.

School districts of sufficient size have uniformly adopted online student information systems with automated reporting features to satisfy state and federal requirements. The positive impact on student achievement and classroom management has been via the communications capability of these systems. Schools protect their student-level data by following the FERPA guidelines.

Student performance data based on traditional standardize testing models provide indicators of overall student achievement and school program effectiveness, but are not as timely in that one must wait months or years for valuable information to become available. Having real time data on student achievement, attendance, demographics and testing can provide timely assistance as needed. This creates a much more dynamic, timely and authentic learning experience.

Student information systems have increased the use of electronic record keeping by teachers, and greater accountability. When information from the classroom is available real time, school districts, state departments of education and the federal government can make data driven decisions that have immediate positive impact. By having grassroots data driving reform programs, instructional leaders have ownership of the very programs that are being designed to improve student achievement.

In Alaska, issues with network stability created by a lack of bandwidth and inferior infrastructure that can cause staff distrust of online data keeping systems. Teachers and administrators are all able to access student achievement, attendance, demographic and standardized testing data real time. The lack of Internet access in areas outside of school especially from home remains a barrier to families being able to get timely access to information and being a real part of school reform efforts.

a. Many school systems have built Adequate Yearly Progress (AYP) systems to fulfill accountability obligations. Have schools and school districts had success building online student data reporting systems that have had a positive impact on student achievement and/or classroom/school operations?

- DIASIS has been a great asset to our district as a data warehouse. (District F)
- *Our district uses Teacher Ease which is a web based SIS and Lets Go Learn. (District B)*
- Our Assessment Reporting System (ARS) is built from the lens of the classroom teacher. Since teachers under FERPA can only have access to the students they currently serve, the system reports current students. If a student transfers within the district, the data on the Assessment Reporting Student automatically moves to the newly assigned school and teacher. ARS provides the assessment data, along with a multitude of teacher resources,

in one place for teachers to access. The system has various sorting functions that allow the classroom teacher to drill down to specific subgroups and individual students. The system also allows the teacher to identify academic strengths and weaknesses of the class as well as individuals. Administrators can do this at the building level. It has changed classroom/school operations over the years that it has been available. This data, combined with data from other sources, is used on a regular basis by most teachers and administrators to monitor the progress of their students. Any upgrades to the system are based upon teacher input because the primary purpose of the system is to meet the needs of the classroom teacher. (District J)

How have principals, teachers, students, or families benefitted?

- Authorized persons such as parents, guardians and educators can see current, up to date info on grades, attendance, behavior, etc. which aid in evaluation of the student and immediately alert to problems which facilitates timely interaction – a good tool. (District B.)
- *By being constantly aware of student progress they have effectively incorporated classes to address students with educational needs. (District F)*
- A parent is able to assist their child by being aware of the expectations and outcomes in the classroom. Help can be provided to the student immediately either by phone, email, or the World Wide Web, rather than waiting for the next progress reports to go out to all students. (District L)
- *Families can see student progress (District A)*
- An administrator can aggregate data allowing them to provide professional development to teachers when they observe that student achievement is lacking in a particular content area. Again, the assistance to the staff can come long before it would in a traditional record-keeping environment. (District M)

b. What barriers or issues have prevented implementation of such solutions?

- Staff trust of online data keeping systems is difficult to establish. This can often be attributed to issues with network stability created by a lack of bandwidth and inferior infrastructure. Data systems are only as good as the information entered into them. Real time data is only real time when users update the system as soon as new data becomes available. Many schools do not have the personnel dedicated as a data steward or the time to really analysis the data available. (District L)
- *The lack of Internet access in Western Alaskan villages is a barrier. Parents had no Internet access and some villages still do not have broadband. The so-called "Alaska Waiver" did not work as the terminology and conditions made it totally unworkable. (District A)*
- Once again, limited funding which inhibits acquisition of systems, any data migration and staff development/training to fully use the systems and get all the benefits from the systems. (District B)

c. Within these systems, how do schools and school systems protect student-level data?

- School policy, in accordance to law, to enforce privacy and limit access to those needing to know; network security limiting access to the systems to authorized persons with proper user account and password; all systems have further built-in intrinsic levels of security which allow viewing of data to students and parents/guardians or various levels of ability to modify the data by pertinent teachers and administrators. (District B)
- *Online security must be approached with a layered strategy incorporating strong passwords, data encryption, physical network restrictions as well as other protections. (District L)*

d. How have student data reporting systems supported school reform movements?

- Helps to identify and target specific needs of students and helps with planning student instruction. Helps plan professional development. (District B)
- *Help by providing data for strategic planning for the district. (District F)*

EDUCATIONAL DATA INTEROPERABILITY

7. We seek comment on data interoperability projects utilizing the Internet and/or wide area networks (WANs). Such interoperability projects could include student record transfer solutions between enterprise software applications within a single organization, or inter-agency data transfers.

In the State of Alaska, the State Reporting Manager (SRM) solution has been a success for school districts by simplifying the data transfer from many student information systems into the state. By focusing on areas of data duplication in reporting, the state was able to deliver a set of tools that allowed data managers to simplify the process of submitting critical information. By having districts from around the state test the solution before requiring its use, issues were resolved before serious problems arose with the tool. When final deployment came about the tool had already gone through testing with many districts across the state making for a stable tool.

Education has many stakeholders that have differing views on what data is important when making decisions. But, agreement on what data is critical is the first step in a successful data interoperability project. The UNITY, state longitudinal data system, has sought to bring together the various stakeholders to determine which data is available through various web portals. On of the challenges has been to have the data set must remain relatively stable from year to year as development time is expensive and school districts do not have the resources to modify schemas continually.

a. How effective were these projects?

- The UNITY project has been a work in progress for several years, effectiveness is unknown. Vertical reporting is just being implemented but not operational at this time. (District F)
- *Quite successful, we have saved at least 1.5 fte this year by automating. (District J)*

b. What metrics were used to define the projects?

- The maintenance impact, number of students and staff and time spent managing the application to prioritize the automation (District J)

c. What barriers or issues have prevented implementation of such solutions?

- To create a true solution to data interoperability, stakeholders must agree on the information that will assist decision making. Often the shareholder group is extended beyond the logical boundaries of the project creating a type of "mission creep". When focus on the original purpose is lost, the technical hurdle of bringing disparaging systems together becomes expensive and time consuming. (District L)
- *The biggest barrier is the vendor not being ready to handle a large District automation project. Most are not setup to handle groups of our size. (District J)*

d. What security systems were implemented and were they effective?

- Online security must be approached with a layered strategy incorporating strong passwords, data encryption, physical network restrictions as well as other protections. (District L)
- *We send information back and forth using standard encryption methods. (District J)*

COMMUNICATION AND VIDEO SYSTEMS

8. We seek comment on implementation of other online applications in schools and school systems.

The State of Alaska continues to require bandwidth to be able to take advantage of online applications in school and school systems. Communication tools like instant messaging are just being realized to support instructional programs, as they have been for administrative functions. The districts within the State of Alaska have used online video conferencing to provide students the access to "highly-qualified" teachers and courses that may not be available in their location. Social networking tools are starting to first be used for professional development for educators and then expanded to use by students as they are determined to support instructional goals.

Below are some implementations of these online applications:

- Instant messaging has been put to effective use in classrooms where it has been integrated into the curriculum as a collaborative tool. For example, students in a writing class are provided a prompt and joined in a multi-user messaging session. The students are able to collaborate in multiple groups to develop the idea. By using the messaging software, all comments are saved and a running dialogue is established between the students and instructor. This dialogue can be easily returned to at a later time, saved by each student for personal reflection, as well as copied to the teacher for assessment.
- Video conferencing technology offers countless possibilities for education. Possibilities include small group meetings, multi-school project collaboration, interactive on-line fieldtrips, formal instruction that provides

students in low enrollment sites access to a highly qualified, connection with guest speakers and experts, and professional activities such as meetings and interviews.

- Second Life is a free resource that is marketed as the "Internet's largest user-created, 3D virtual world community". Professional development classes for teachers typically include face-to-face and online learning avenues. An element of these credit classes may be monthly events held in Second Life to build knowledge and community. Access to this virtual world literally opens the world with a synchronous, virtual communication tool – a cyber world where authentic learning can occur.

a. How have communication tools like instant messaging and online video conferencing supported instructional program implementation?

- We regularly utilize teaching from a central location using videoconferencing teleconferencing. Our district office has two studios going most of the time and one presenter classroom. 3 or 4 teachers operate from these studios with classes up to 60 students. Certified teachers who are not highly qualified in the area support students at each site. This system addresses the problem of lack of highly qualified teachers in Western Alaska as well as the expense of travelling from school to school. It also means that students can stay with their families and not leave home to get the instruction they need to prepare them for adulthood and the workforce. In addition, the high price of fuel ($5-$8 plus per gallon in this region) makes air travel from school to school within the district prohibitive – this problem is increasingly addressed by video conferencing. Streaming over the Internet is supplementing the VTC system but until we get more bandwidth it will remain a limited alternative to VTC. One of the major student and teacher uses of the Internet is to help students achieve their goals is research. (District A)

- *Video conferencing has been used for trainings, meetings, online courses & CEO/CIS. (District B)*
- In rural Alaska, schools are attempting to teach K-12 students with 2 teachers (in some areas 1 teacher). These teachers needed to be able to teach every grade, every subject, every concept, and deal with every disability and learning style by themselves. Sometimes news was available on the single channel that they got, sometimes the newspaper would get there several days to weeks later. The internet became a connection that had previously been lacking. Video-Conferencing brought classes by subject area teachers to places that lacked them. (District G)
- *Not currently available in district (video conferencing – other than Skype) – District F*
- Video conferencing has been used in the district to offer high school students the opportunity to live at home and attend classes taught by highly qualified staff, even when the student population of a school was not large enough to support even one high school level staff member. (District E)
- *Instant messaging systems and online video conferencing is critical to our educational technology support systems - in a remote area where all travel between schools must always be accomplished via small planes and often in very dangerous flying weather, having options for support and training that do not require physical travel are critical. (District C)*
- In many situations, elementary principals prefer to use video conferencing tools (e.g., iChat, Skype) from their laptop with a built-in camera. Through the use of computer-based video conferencing they are able to communicate and collaborate with each other while remaining in their school. Throughout the district there are committees and credit classes that use computer-based video conferencing tools to conduct instructional and administrative business without the need to drive across town. (District J)

b. Where have live video streaming programs been implemented to scale?

- From the district office to all schools on a daily basis (District A)

- Our district now offers some mandatory training through an on-demand video streaming resource that was implemented this school year. This resource is available to all district staff members and numerous resources are available beyond the mandatory trainings. (District J)

c. Where have social networking tools been implemented to support instructional goals?

- Our district uses NING to have interactive comments, discussions and document sharing which works well. Our district has had to block other social networking sites due to misuse. (District D)
- *Google Docs, clips from Myspace, Facebook, Youtube, blogs and wikis. (District B)*
- Our district supports an island in Second Life, which is a synchronous online virtual community. We use our island to meet educational goals through discussion and collaboration between district staff, as well as individuals involved in education from around the world. At one high school in the district, students in the Engineering, Architectural, and Robotics classes use the Teen Grid on Second Life to model and test design theories in minutes rather than the days or weeks that it would have taken in the previous instructional approach. (District J)

d. How have concerns of content appropriateness/content blocking been addressed in rollout to students (especially in kindergarten through grade 12)?

Without exception, school districts in Alaska have adopted Internet Safety Policies for both staff and students. Many of the districts in Alaska have imaged computers that students sign on to with their own password to access the applications available to them and the documents relevant to their own education. All school districts have an Internet protection measure in place which is often administered at the district level. This Internet protection measure is modified by the district to

meet a level of content blocking commensurate with district policy, and can be modified when needed.

- First off, teachers and staff are the first line of defense and must be aware to the greatest extent possible what students are doing with the technology. This is facilitated by arranging computers in such a way as all monitors are visible to the staff at a glance if possible. Also monitoring software, like Remote Desktop, on staff workstations can be utilized to allow monitoring of computers. Staff development is offered to train staff on best Internet practice in education. Even with these measures it is not possible to completely protect students from inappropriate content, particularly, when students bring their own notebooks to school, so further measures are taken and I have seen and used several measures of content filtering; two of the best are described below. Our ISP offers our district turnkey third-party content filtering tailored for schools as part of its Internet service which uses updated databases to place websites into about 80 categories which can be monitored, monitored & blocked, or monitored & allowed. It also allows white and black list capability for further granulation. Our ISP provides a web site which authorized school personnel can access to configure the filter as the school wants. One nice thing about this is that the filter is not on the school premise so it can't be tampered with or bypassed as our district has had happen in the past when it owned and used its own filter. (District B)
- *Yes - content filtering and the reasons for it have been thoroughly explained to all students and parents. (District C)*
- Blocking has been done as needed with exception of main content areas (ie: porn, violence, etc). (District C)
- *Using our ISP's online filter program (District A)*
- We have filtered content, quality web-based resources that we subscribe to, a process in place for teachers to request unblocking of content and blocking of questionable content, and we are working on a district-wide curriculum regarding Digital Citizenship, which will be imbedded into the regular core curriculum. (District J)

e. What single sign-on and identity management tools and approaches have schools and school systems used to ensure security and seamless user experience across online tools?

- Within districts, unified directory structures are becoming the norm to eliminate cumbersome management and frustrating user experiences. The maturity of LDAP as well as other directory management tools has created a medium for services to exchange user information in a manner that was difficult or impossible in the past. This exchange does place additional stress on the wide area networks of school districts. (District L)
- *Microsoft Active Directory and Mac Open Directory to recognize and group users with differing levels of security and access along with the two above mentioned solutions: our ISP's filter offering and Iprism from St. Bernard software which can also deal with unknown or rogue users and computers. (District B)*
- Networks are constructed so as computer users have to have appropriate login and password and users are placed in profiles with different levels of access to the Internet. Wireless networks are encrypted so that only authorized users and computers can gain access by wireless. Computers are further grouped by MAC address into groups with different levels of access. All computers are required to run approved antivirus/anti-malware software. (District D)

COLLABORATION AND COMMUNITY SYSTEMS

9. We seek comment on implementation of collaboration and best-practice-sharing online systems. For example, we have been directed to a number of systems which demonstrate features of collaboration or online community capabilities including: www.curriki.org, www.nylearns.org, www.oercommons.org, www.schooltube.com, www.boepilot.org.

The State of Alaska implementations of collaboration and best-practice-sharing online systems have had only limited success. Maintenance has remained a major challenge due to staff time limitations and the constant evolution of the Internet. Pilot projects have been implemented to provide educators in Alaska lesson and resources aligned to our standards. The state continues to seek resources that have been determined to be high quality and standards-based.

The potential for our students to participate in collaboration projects throughout the state, country, and worldwide is just starting to be realized with the advent of collaborative tools. However, the realization of the potential will require a more robust broadband access than is currently being deployed at many of our districts.

a. Please provide examples of successful online collaboration systems rolled out to educators and/or students. How have projects measured success?

- Flat Classroom Project - Students collaborate with peers from around the world using wikis and blogs to explore, research, and discuss education in the 21st century. The culminating assignment for this project was student created videos in which students discussed how technology will change education. (District L)

- *Prince William Sound Youth Media Expedition - Alaska Geographic, Chugach National Forest and National Geographic sponsored a program this summer called the Prince William Sound Youth Media Expedition. This expedition served as a pilot program for the Chugach Children¹s Forest programs that will officially launch this fall and next summer. The PWS youth media expedition entailed 9 students from around the sound gathering together for a 2 day camping trip and 5 day boat expedition through the western sound. The goal of the trip was to have the students interact with each other and experience all aspects of PWS and Chugach National Forest land. The students were then asked to create a media product that shared their perspective of the importance of the land and the sound with other youth. (District M)*
- We have individual teachers using some of the tools mentioned above, but not as a district-wide implementation. We are using First Class as a district wide collaboration tool for educators and students. 100% of our staff and students in grades 7-12 have accounts in First Class and use them daily. Since implementing First Class, this is the first time 100% of our staff has utilized email. Now they have an email that has a collaborative desktop with organized areas of the district personalized for each employees' or students' needs based on the user groups they belong to.
    - With our ever-changing staff in rural AK this system makes life easier for those coming in to be totally connected immediately to everyone in the district and the information they need about teaching in our district laid out on their desktop.
    - Students and teachers can use a collaborative workspace to drop /add assignments.
    - Our teaching staff can access curriculum and post lesson plans in the workspaces provided for these activities.
    - Forms for all purposes can be found in the specific workspace and accessed any time Internet is available.
    - Students hold government meetings through the chat feature to record as minutes of meetings for anyone who missed. (District H)
- *Moodle in*-district *(District C)*

- The fourth and fifth grade students in our district collaborated with the University of British Columbia and the Vancouver Aquarium on a fur seal pup study in which they had weekly video conference with the scientists working on the project. They observed the seals and the scientists interact via video cam, discussed seal growth, biology and development with the scientists, and asked questions that they worked on during the rest of the week. The culminating experience was a trip to the university and the aquarium for some hands-on experience for the fifth grade students. (*District* E)
- *Moodle and Google Docs are emerging as critical collaboration tools in our district. While we do not currently have formalized benchmarks to measure success,* teachers *continue to request training opportunities in high numbers, and anecdotal evidence suggests that student engagement is improving as a result of blended collaborative learning environments. (District J)*

b. If they were not successful, what were the major challenges?

- We concede that the major challenges to implementing successful online collaborative systems continues to be 1) bandwidth availability, and 2) a means of accurately evaluating the success of such online activities with respect to instructional goals. (District K)

c. What subject matter(s) attracted the most use or were the most helpful for educators or students (e.g., instructional practice development, classroom management strategies, mentor/mentee relationships, administrative processes, student projects, student research)?

- Our district has excellent examples of student projects utilizing online collaborative tools in all curricular areas. Many of our professional development initiatives also utilize these tools, including our teacher mentoring program. (District J)
- *Our district uses the iLife Suite extensively in the classroom. These multimedia files are managed by students using AquaMinds NoteTaker, which serves as a digital notebook and journal and creates media-rich electronic portfolios that can be used for assessment purposes. This is especially useful for schools that are standards- or project-based. (District L)*

INNOVATION IN BROADBAND AND ONLINE SYSTEMS

10. We seek comment on opportunities for government to support innovation in the education technology sector, both in terms of driving innovative program and product development, as well as driving adoption.

In 2005, only 17% of teachers and 8% of students nationwide had access to handheld computer devices in schools,[13] with somewhat high percentages in schools where the percent of students eligible for free or reduced-price lunch is above 50%. The Alaska State Legislature has given $7.5 million since 2006 in support of one-to-one laptop programs in Alaska school districts. These programs could be expanded from 28 school districts to all 53 school districts with increased federal support.

Increasingly, Alaskans are demanding online services from State agencies. Since a key role of the State of Alaska is to ensure accessibility and availability of State services to all Alaskans, one opportunity to drive innovation in schools and school systems would be to introduce not only high school students but their parents and other community residents to the content of state websites, i.e., to familiarize the entire community with the increasing variety of services available through State websites. Unfortunately, under the current E-Rate program regulations, adult access to the Internet is largely prohibited. The opportunity currently exists for the Commission to lower this barrier by extending eligible use to the community during after school hours.

[13] 2008 *U.S. Statistical Abstracts*, Table 251, page 164,.

Despite this “stovepiping” of Internet anchor institution access in rural villages, each year the State tries to expand broadband access to its services. Nevertheless, rural businesses, residents and community governments (tribal and municipal) still have unequal access to private and government services such as: online business license applications, government program applications, research and data, federal tax reporting, and electronic banking. Borough governments too, like State offices, provide important access for citizens to web based information and resources. Many have a public computer set up for use by citizens that cannot afford computer service but these scarce resources are frequently overwhelmed by demand and must put time limits on usage and exact high per page printing charges (e.g., $1.00) in order to sustain their public connections.

Most rural Alaska households don’t have the resources to have state of the art computers or software, with as many as 70% below federal poverty level. Therefore they rely on public and non profit institutions to get access to the internet. Although State of Alaska offices exist in rural regional centers to help individuals and organizations with access to State services, these State offices do not have broadband access that fully utilizes the available broadband speed and capacity in private owned delivery systems.

a. What are the opportunities for government to support technology literacy, access to devices, and adoption through school-based programs for students, their families, and their communities?

- We recognize that the role of federal government is to collect, share and support best practices, and to this end we encourage the government to continue in this supporting role. We do not wish to see the federal government support any one program over

another, but rather offer support in whatever programs or initiatives a district, state or community recognizes as most valuable for their needs. (District K)

- It would be helpful if there were resources for communities to work with vendors to provide discounted mass purchasing of software and hardware for families to purchase so they can support at home the educational initiatives associated with the schools. Create digital equity by allowing districts to provide wireless access to families and students based on affiliation to the school district vs. physical locations. (District J)

b. What are the opportunities for government in setting technology standards?

Alaska already takes an active role in technology standards with respect to student education. Alaska standards are organized as both general content standards, and as Performance Standards (Grade Level Expectations). Supplemental Education Service programs are aligned at the Performance Standard (Grade Level Expectation) level wherever possible. The Department of Education standards can be found at http://www.eed.state.ak.us/standards/

Individual school districts may have their own additional standards. For example:

- ASD performance standards, benchmarks and Indicators.
  http://www.asdk12.org/depts/library/standards/ASD_LibraryStandards.pdf
  http://www.asdk12.org/depts/library/standards/index.asp

School District comments:

- Our district supports the work of the International Society for Technology in Education and their National Educational Technology Standards for Students, Teachers, and Administrators. (District J)
- *The federal should play no role in setting standards - the power to regulate education is constitutionally one reserved for the states. (District C)*

- Technology is changing rapidly, creating a difficult task for departments of education. School districts are able to more quickly evaluate and adopt new standards that address the needs of students. (District K)

c. What are the opportunities for government to drive innovation in schools and school systems?

- The government is uniquely able to provide funding to innovative projects and assist in assessing the value of those programs. (District K).

d. What are the opportunities for the government to support research and development to drive innovation to the education technology market?

- There exists a significant need for unbiased research examining the effectiveness of vendor driven software resources available to support student learning. This would assist schools and districts in making informed decisions regarding the purchase of student resources, which is especially critical given limited funding and implementation support. (District J)
- *Funding for research and development would be great. Many sources will pay for product or developed programs, but in a lot of cases we just need to spend the time evaluating potential solutions. (District K)*

E-RATE MODIFICATIONS

11. As part of the national broadband plan, we seek comment on how the Commission can modify the Erate program to more effectively meet the needs of applicants as well as whether the program can be a vehicle to stimulate the adoption of broadband throughout communities. For example, in Portugal researchers have found that the usage of broadband in schools creates a "spillover" effect that leads to greater broadband adoption in the community as students increase their Internet usage at home and transfer their technology skills to other family members.[14]

Until there is a national broadband plan, *E-Rate is the national broadband plan*! Please be extremely careful when making any changes to the E-Rate program. It should be a cornerstone in the national broadband plan, but not a keystone which must bear the entire weight national broadband deployment edifice. *Primum non nocere*.

In Alaska, spill-over effects rarely occur in remote villages with depressed economies. On the contrary, anecdotal evidence indicates that Internet access in rural schools is creating a generation gap between children, their parents and elders. The "digital divide" between information-haves and have-nots begins at home. Adults sometimes are reacting with muted hostility to the growing mastery of children over a resource that is currently unavailable to adults in most rural villages because E-Rate subsidized bandwidth to the schools cannot currently be used by the communities for purposes of adult education.

[14] Patrick Agyapong and Pedro Ferreira, *Spillover Effects from Wiring Schools with Broadband: Implications for Universal Service Policy*, 37th Research Conference on Communication, Information,and Internet Policy, Arlington, VA. Sept 25-27, 2009, available at http://www.tprcweb.com/images/stories/papers/AgyapongFerreira-TPRC2009.pdf (last visited Oct. 21, 2009).

While the "Alaska Waiver" was a good idea in its day and did encourage ISPs to provide basic Internet connectivity or face competition from within rural community, the rules and responsibilities attached to the waiver with respect to setting up a village ISP were too complex for any community to actually take advantage of it. Now it is not basic Internet connectivity that is needed but basic broadband access. We propose several other solutions to the problem of broadband access in rural and remote communities below.

a. Currently, schools and libraries may obtain discounts on various services that provide highspeed access to the Internet as telecommunications and Internet access (priority 1) services.[15] We are aware that applicants may characterize their funding requests according to terminology used on the eligible services list, such as DSL, "internet access via cable modem," ATM, frame relay, T-1, T-3, Ethernet, OC-3, OC-12, ATM, "internet access via fiber optics," etc. We seek information that would enable us to better understand at a more granular level what broadband services eligible applicants are buying today.

Because school districts within Alaska have independent contracting authority, it is difficult to gather and aggregate this data in the absence of a statewide educational network. Nevertheless, EED does collect related information provided by school districts in their annual Budget/Inventory Analysis for E-Rate Components reports to EED which we are currently analyzing. We would be happy to make the data extracted from those reports available to the FCC.

[15] The Commission's priority rules for the E-rate program provide that first priority for the available funding for all discount categories shall be given to requests for telecommunications services and Internet access (priority 1 services). 47 C.F.R. § 54.507(g)(1)(i). The remaining funds are allocated to requests for support for internal connections (priority 2 services), beginning with the most economically disadvantaged schools and libraries, as determined by the schools and libraries discount matrix. 47 C.F.R. § 54.507(g)(1)(ii); *see also* 47 C.F.R. § 54.505(c). Since funding year 2000, the E-rate program has committed the maximum $2.25 billion before funding all of the requests for internal connections. 47 C.F.R. § 54.507(a) (establishing annual cap of $2.25 billion per funding year).

The results from the February 2009 Alaska results from the Gates Foundation Public Library Broadband Assessment project can also be made available to the FCC. There is some confusion among Alaska E-Rate applicants in remote communities as to which technology is actually delivering their Internet connectivity since coax and copper are both coming into their buildings, but those landlines are simply distribution mechanisms for the bandwidth delivered to a satellite earth station at the edge of community. Such complexities and lack of end user knowledge makes information provided directly from the ISPs all the more accurate and valuable.

One can argue that the primary goal and achievement of E-Rate has been not to accelerate broadband deployment but rather to connect schools and, to a lesser degree, libraries with some degree of Internet connectivity. E-Rate has not traditionally promoted fiber deployment and it was not too many years ago that some FCC staff thought a T-1 per school would be sufficient. At this point, at least some time should be spent analyzing a decade of Priority 1 and 2 expenditures to determine with some degree of accuracy the impact this large, long-term investment has had on fiber deployment to anchor institutions.

If there has been a problem, perhaps it has been the bottom-up approach that E-Rate has taken where each school district and library must first recognize the need for fiber in order to scale its broadband into the future. And perhaps too often those who have recognized the need do not necessarily have the required local match, nor can they rely on Priority 2 to get the additional internal connections equipment which may be needed for fiber connections.

Overall, what percentage of priority 1 funding is subsidizing broadband services at what speed levels, and what percentage is subsidizing basic voice service (wireline or wireless)?

This data is currently unavailable for Alaska schools and libraries though we will do our best to compile this information in the near future.

Can we segment the applicant community that receives discounts on higher capacity broadband services based on specific characteristics (such as number of students, rural vs. urban, discount level, etc.)?

Rural and remote broadband is more expensive than urban areas for several reasons: if provided terrestrially, it is invariably in a high cost area; if provided by satellite, the cost is higher than urban terrestrial broadband by a factor of 10. Alaska school districts have indicated their desire for an in-depth study of rural/remote versus urban costs in order to ensure that eE-Rate funding is equitably distributed throughout the state in terms of available and affordable broadband speeds.

Additional segmentation by other school and community characteristics such as number of students, discount level, average household income, population size, population dispersion, language spoken at home, population by race, and community anchor institutions other than schools would provide additional insight into what incentives can be created and barriers removed to broadband deployment initiatives in different categories of communities. We encourage the FCC, working with other government and state agencies, to pursue all of these metrics and more.

While population dispersal is an important metric in broadband deployment planning, more important is recognition of the special needs and requirements of

small communities, defined as those less than 2,000 in population which have underperforming economies incapable of supporting broadband deployment or services without some form of subsidy or concomitant efforts to jump-start their economies. Though largely rural and remote, these communities may also be found in urban areas as ethnically or racially segregated populations having serious levels of poverty and un- or under- employment. The national broadband plan should address these communities as a separate category with special problems and needs and may find the Census Bureau's Census Designated Place designation useful in this regard.

b. When applicants develop their technology plans, what factors do they consider in determining their bandwidth needs?

The most important factor is probably the school district budget which must take into account both the district's bandwidth requirements and the cost. Bandwidth needs are directly tied to existing and planned application usage and the number of users. Cost considerations include: (1) the budget resources available to support a district's technology initiatives, including sufficient E-Rate match; (2) the adequacy of E-Rate funding for both recurring and one-time costs (based on the organization's E-rate discount); (3) other non-recurring costs not supported by E-rate such as electrical upgrades and additional equipment; and (4) additional bandwidth management tools (e.g., traffic shapers) and IT support that may be needed when bandwidth is significantly increased. Increasingly, E-Rate applicants will need to employ sophisticated bandwidth other network management tools to effectively utilize increased bandwidth. 16

[16] The work of the M-Lab group in developing such advanced tools should be noted: http://www.measurementlab.net/

Because of the ever expanding uses of broadband technology in education, Alaska schools are constantly at risk of underestimating their bandwidth needs. Ideally, in writing their technology plans, schools should be free to imagine their futures without bandwidth constraints and to increase their bandwidth demands according to the actual applications they expect to run in the coming years. In the end, broadband Internet access should not be a bottleneck to getting things done in schools. At the same time, LANs Networks should run at local WAN speeds or higher so as not to be bottlenecks to Internet access and the use of bandwidth intensive applications. As we move towards cloud computing with outsourced applications and data storage, this will be all the more important: applications which once ran locally on the school LAN will now be running over the Internet cloud .

In some many states, applicants not only look at their current bandwidth utilization, but also at future growth and required resources required for state and local initiatives. States with centralized state networks are able to provide each district and school with bandwidth utilization information which shows each school's capacity, as well as periodic usage such as daily, monthly and yearly reports of utilization. Visualizing this data allows schools and districts to foresee both when there will be issues where more bandwidth is required and times of the year when utilization is pushing the maximum capacity.

c. We seek comment on program modifications to maximize the use of broadband connections that are subsidized by the E-rate program. Recognizing that the statute requires that discounts

be provided on services used for "educational purposes," we seek information on whether, and if so, how, past interpretations of the "educational purposes" requirement have restricted demand aggregation at the community level to support higher capacity broadband.[17] *For example, the program could be modified to allow for use of broadband facilities at schools by the general community, rather than just by school faculty and students.*[18] *We seek specific examples of whether and if so, how, expanding the permissible use of E-rate supported services could confer benefits to a larger community or encourage partnerships with private or public organizations to pool resources to maximize broadband utilization. What practical or operational impact would such a change have?*

As noted in the introduction, the Alaska Waiver has gone unused in Alaska because of its complexity. While the 100 or so local libraries in Alaska work hard to meet the ITC training needs of their communities, there are *more than twice that many communities without libraries*. In contrast, any community with more than 10 children in Alaska can have a school and as a consequence of the state's investment in education, there are currently more than 500 schools in Alaska. Accordingly, EED supports the comment of the University of Alaska to this RFI because it asks the FCC to broaden the definition of "educational purpose" to encompass all educational purposes in the public interest. A change of this nature will enable E-Rate subsidized broadband access to be made available to communities when school boards authorize the use of school networks as public computer centers during after school hours. The University of Alaska suggested the following language:

> *In addition, post-secondary educational, vocational and job training services delivered to an eligible entity, regardless of audience, shall be considered eligible provided said service does not increase the cost to the program nor require the eligible entity to seek additional funding under the E-Rate program. This provision does not require that an*

[17] *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, 9072, para. 562 (1997) *(Universal Service First Report and Order)* (subsequent history omitted).
[18] *Federal-State Joint Board on Universal Service, Petition of the State of Alaska Petition of the State of Alaska for Waiver for the Utilization of Schools and Libraries Internet Point-of-Presence in Rural Remote Alaska Villages Where No Local Access Exists and Request for Declaratory Ruling,* CC Docket No. 96-45, Order, 16 FCC Rcd 21511, 21513-14, para. 6 (2001) (*Alaska Order*) (granting limited waiver to permit members of certain remote Alaskan communities to use excess Erate services when not in use by schools and libraries for educational purposes).

eligible entity permit such program delivery in its facility, but makes this activity permissible, at the discretion of the eligible entity. Any additional costs due to supervision, access or content delivery are the responsibility of the entity, the delivering agency and/or the participants and will not be covered by E-Rate.

This kind of change in the definition of educational purpose would have several immediate benefits. It would:

- Allow Alaska schools to open their computer facilities as public computer centers for use by the local community.
- Immediately increase the potential number of public computer centers in Alaska from less than 150 to over 700
- Connect hundreds of remote communities and villages to a wider world of educational, vocational and workforce training opportunities
- Increase demand and support for broadband deployments to small communities by demonstrating the value of broadband services (the opportunity to "try before buy")
- Accelerate the rate of broadband adoption in those communities where broadband is already available by teaching adults ITC skills
- Strengthen local government and municipal agencies by expanding employee training opportunities through distance educatio**n**

This is the single E-Rate program change which would have the greatest and most immediate impact on broadband deployment in Alaska.

d. We seek comment on any legislative changes that would expand the classes of eligible users. For example, the statute currently limits E-rate support to elementary schools and secondary schools, which are defined by each individual state.[19] What would the impact be of modifying the statute to permit colleges, community colleges, pre-kindergarten, Headstart, or other entities to participate in the E-rate program?[20]

Alaska does not support the expansion of eligible entities now or in the future, with the exception of Head Start programs located in schools which are associated with and approved by EED.

e. To what extent does the fact that the E-rate program does not currently fund computers and other end user equipment inhibit the use of broadband by schools and libraries? Likewise, to what extent does the fact that the E-rate program does not currently fund training for teachers or librarians in the use of technology inhibit the use of broadband by schools and libraries?

Alaska does not support the expansion of the E-Rate eligible services list to fund computers or training for additional categories of eligible users unless and until the demand for current eligible services, including Priority 2 services, is fully met. At such time as demand for current eligible services is fully met, the State of Alaska

[19] For the purposes of the universal service programs, "elementary and secondary schools" are defined by the Elementary and Secondary Education Act of 1965, which defer to the definitions of those terms by individual states. *See* 47 U.S.C. § 254 (h)(7)(A), 20 U.S.C. § 7801 (18), (38).

[20] We note that certain states currently include pre-kindergarten, Headstart, and adult education within their definitions of schools. *See* USAC Website, Eligibility Table for Non-traditional K-12 Students and Facilities, http://www.usac.org/sl/applicants/step01/non-traditional-k-12/k-12-eligibility-table.aspx (last visited Sept. 8, 2009). However, college education would be prohibited because, pursuant to the Elementary and Secondary Education Act of 1965, "the term 'secondary school' means a nonprofit institutional day or residential school, … as determined under State law, except that *the term does not include any education beyond grade* " 20 U.S.C. § 7801 (38) (emphasis added).

would proceed cautiously before adding additional eligible services and equipment to this program.

We seek specific information regarding what types of services are not available to teachers, students and library patrons due to lack of funding for end user equipment and training. If the E-rate program were to fund computers and training, what would the projected demand be?

ICT training for teachers is never enough given the rate at which technology and social networking applications are changing. What teachers and librarians need is more time to take such training and to get them more time would require hiring more teachers and librarians (especially school librarians), not simply providing more training opportunities. Many distance learning opportunities exist but often smaller schools and libraries have inadequate bandwidth to take advantage of these opportunities.

In addition, smaller libraries need more physical space before they can accommodate more desktop computers. Given the demand for broadband access, Alaska libraries are adding wireless networks so that additional users can gain access using their own computers, or laptops purchased by the libraries themselves.

From a policy perspective, what are the potential negative consequences if such a change were adopted?

Without greater funding, the negative consequences to the E-rate program would soon be real and no longer potential. After years of building trusted relationships with USAC and SLD, existing program participants would soon be disillusioned if the current balances within the program were to deteriorate even further. If that

happens, E-Rate could no longer be viewed as the reliable source of school district funding for broadband deployment planning and implementation that it has become. Primum non nocere!

f. Currently, WANs are not eligible for support "to the extent that states, schools, or libraries build or purchase a wide area network to provide telecommunications services."[21] *Would modifications to this rule regarding WANs, which link schools and libraries within a district or link several school districts together, result in greater broadband deployment?*

Modification to allow WAN eligibility could have an positive overall impact on Alaska schools and other anchor institutions like libraries and rural health care centers. EED would like the FCC to facilitate greater collaboration among these institutions in aggregating their respective bandwidth requirements for more efficient network operations and lower costs, particularly in smaller communities where the business case for residential broadband deployment is lacking and anchor institution Internet access is "stovepiped" with each institution separately contracting for Internet access. We would support the eligibility of WANs only if such construction would be accessible to the public, when it was the most cost effective solution.

In the absence of a state network with staff trained to support large-scale consortium applications, the administrative burden which consortium applications must shoulder is simply too great for many to bear. Despite the amount of funding available through E-Rate and the savings to be found in consortium applications, it

[21] 47 C.F.R. § 54.518.

is simply viewed as too difficult and complex for any one institution to go after as the lead agency.

This reluctance is due largely to the cumulative effect of minor differences between program rules (and a few major differences, i.e., different eligible services lists) between E-Rate, RHC, and the RHCPP, as well as the administrative tasks required to submit and implement consortium applications that include both schools and libraries.

Given the state of the economy, consortium memberships are constantly in flux and can create major delays in funding when member institutions withdraw from the consortium or get closed down, just as new members wanting to join the consortium create administrative delays. Finally, major broadband initiatives are also discouraged by the inability to include ineligible entities without incurring onerous cost allocation reporting requirements at a level of granularity that state networks and ISPs may be able to meet but most ad hoc consortiums cannot.

g. Are there any programmatic rules and policies that have the effect of deterring requests for broadband funding?

The lack of any explicit program emphasis, instructions, policies or preference for broadband deployments is the greatest deterrence to requests for broadband funding. Given the history of the program and the excess demand, there has been a historical perception by applicants that simply asking for large amounts of bandwidth might in itself endanger ones application. The other major deterrence for broadband requests is simply the lack of E-Rate match and - unlike ARRA broadband funding - the absence of a full or partial match waiver.

For instance, we understand that some libraries have suggested that compliance with filtering requirements under the Children's Internet Protection Act represents a deterrent to program participation.[22] Are there other statutory provisions or Commission rules or policies that may reduce program participation by entities that otherwise would utilize discounts on broadband services? Commenters should be specific in identifying which current rules may create barriers to broadband deployment.

h. We seek comment on these ideas and on other suggestions for changing E-rate eligibility to improve broadband deployment.

In general, to increase spillover effects and accelerate community build-out of broadband deployments to anchor institutions, EED recommends greater cross-program goal-alignment among USF programs and the National Broadband Plan. Specifically, we recommend adoption of the suggestion to open subsidized bandwidth to community use after school hours. In addition, we would encourage the FCC to minimize the build-out of limited-use broadband networks reserved for specific anchor institutions and their specialized clienteles and follow the public model of community access, even if this is limited to after hour access of school and rural health care broadband access points.

At the same time, it must be remembered that the distribution of anchor institutions varies widely across the United States. Only half of US "places" have public

[22] 47 U.S.C § 254(h)(6); 47 C.F.R. § 54.520. *See, e.g.*, "Public Libraries and the Internet 2008: Study Results and Findings," College of Information, Florida State University, funded by the Bill and Melinda Gates Foundation and the American Library Association at 47 (2006) (2008 ALA Study) (noting that 40.5% of libraries did not apply in 2008 because of the need to comply with CIPA's filtering requirements, up from 36.1% in 2007).

libraries.[23] In some states there may be hundreds of communities without rural health care centers. Anchor institution distribution differs widely from state-to-state and according to the health of local economies. Census Designated Places (CDPs), unincorporated places without municipal governments, of which there are probably around 5,000, in addition to the 25,000 or so incorporated places in the U.S. In 1990, some 29 million people – more than 10% of the national population – lived in these CDPs. This is where the unserved and underserved can most often be found: in unincorporated communities without municipal services and often without any anchor institutions. Without a tax structure, it is hard if not impossible to maintain anchor institutions. The existence of a community, however defined, should not always assume the existence of anchor institutions. It is possible if not likely that as little as 50% of communities have public libraries. Schools and health care center penetration is much higher but unlike libraries their broadband access is restricted and walled-off from the community at large, even for purposes of educational training.

The point here is that a national broadband plan which focuses exclusively on anchor institutions may only address the needs of those institutions and not the needs of the surrounding communities., while the smallest communities - those with the least anchor institutions - are underserved or not getting connected at all. The FCC should consider specific policy and rule changes that would accelerate broadband deployments in communities whose small size or population disbursement precludes a viable business case that can attract private broadband

[23] Do not confuse a public library with its service area, where patrons must drive from another community for service or else be served by bookmobile. ALA may argue that every US community *is served* by a library, but with only some 16,000 or so libraries (including branches and outlets) and 30,000 or so communities (incorporated and CDPs), it is clear that only every other community actually *has* a local library. While there are almost 400 communities in Alaska and only 100 Alaska libraries (110 when library branches are counted.) In contrast, almost every Alaska community has a RHC center, but that bandwidth is not multi-purpose and is not accessible to the community at large.

investment. Incentives should be developed for leveraging one existing USF program with another to avoid duplication of effort and "stove-piped" network deployment. For example, the current complexity of program rules discourages the aggregation of bandwidth demand between educational and rural health care programs, particularly in rural communities. The overall accounting and reporting burden should be less, not more, when bandwidth is aggregated. In addition, program rules should be crafted so as to:

- Encourage and facilitate E-Rate and RHC traffic on the same physical network infrastructure.
- Encourage aggregated buying and close cooperation between the two programs, as well as other federal and state broadband opportunities. For example, in combined projects, only one set of program accounting and reporting requirements should apply.
- Encourage the acquisition of long-term fiber IRUs to stabilize pricing at affordable long-term rates.
- Encourage long-term planning and viable sustainability models.
- Encourage policies and rules which promote transparency in terms of reasonable network management practices, including the collection and maintenance and revealing network metrics (e.g., by participation in MLab and/or use of MLab tools, see http://www.measurementlab.net/).
- Require the use of appropriate metric tools and public dissemination of real-time results in exchange for additional cross-program integration permissions and/or waivers.
- Reduce the administrative burden of managing consortia with both eligible and ineligible partners

E-RATE DISBURSEMENT

12. We seek comment on how changing the E-rate disbursement and discount methodology might maximize the deployment of broadband.

a. One possible modification would be to create a new priority level for schools and libraries that do not have broadband or that have extremely slow Internet speeds to permit those entities to receive funding in advance of other eligible requests, which could enable such entities to "catch up." An alternative would be to provide increased E-rate discounts for entities that wish to implement certain levels of connectivity. We seek comment on other methods by which the Commission could implement such changes, if they were proposed.

The State of Alaska encourages the FCC to make available other federal assets outside of the E-rate program, to assist applicants in funding the non-discounted portion of their broadband connectivity projects. Because we feel that one time costs during the first year of broadband deployment may be significant, the non-discounted portion of connecting to broadband will be the applicant's greatest hurdle. Because of this we also suggest that organizations seeking to achieve broadband capability be allowed to utilize other federal funding sources for the non-discounted portion of their costs. While we realize that a 90% discount covers the greatest share of the overall cost, it is often the 10% which is the barrier to our applicants when completing and sustaining a broadband connectivity project.

In Alaska our rural energy costs have skyrocketed and money originally designated to other projects has had to be diverted to address the energy shortfall in districts. In libraries, where budgets are small to begin with (50% of our libraries are in communities of less than 800 people and have an annual operating budget of less than $23,000) this 10% is often what keeps our applicants from requesting broadband connectivity.

b. Currently, the program's funding varies for applicants based on the number of their students who qualify for free or reduced lunch and based on their geographic location.16 Using this measure, discounts range from 90 percent to 20 percent of the pre-discount price for eligible services, with the poorest schools receiving funding to pay for 90 percent of eligible services.

Some rural schools receive additional discounts. The Commission could recalculate these Erate discount levels to factor in not just poverty and whether the school is located in a rural area, but also whether the entity lacks broadband services. In addition, the Commission could change its priority structure to give preference for those schools that have not received funding for internal connections in several years. We seek comment on the extent to which schools that have not received funding for internal connections (Priority 2 funding) need to improve their internal connections in order to most efficiently use their broadband connections now and in the future.

The State of Alaska supports a recalculation of E-rate discount levels that takes into consideration the lack of broadband connectivity within an area. We would support designating underserved and non-served broadband applicants as 90% discount participants, for the purposes of Priority 1 funding requests.

The State of Alaska would also support a change to the E-rate discount matrix, should the Commission decide that the most expedient method of addressing this issue be an additional column in the discount matrix that factors a combination of income eligibility and broadband levels. We recommend that those applicants lacking 1.5mbps connectivity remain at a heightened discount level until such time as they no longer qualify because 1.5mbps broadband has been achieved.

The State of Alaska would like to suggest that the Commission consider methods to extend Priority 2 funding to more applicants. We support the modification of the Priority 2 discount matrix so that the maximum discount an applicant could receive would be 70%. This would require that each applicant have greater ownership of their P2 projects, which are a deterrent to program waste and an incentive to purposeful planning. It would also enable a larger number of our applicants to be the recipient of Priority 2 funding Internal Connections, because the available funding would reach the lower discount levels.

c. *To what extent have current rules inhibited the development of or expansion of existing state, regional or local broadband networks? Are there changes to the Commission's rules that would facilitate these types of networks?*

The State of Alaska believes that if the annual $2.25 billion funding cap is not raised, we cannot consider supporting the funding of WANs. If the FCC were able to raise the funding cap, then the State of Alaska would consider the support of WANs under very limited circumstances and only in those instances where USF supported WAN lines would be required to carry other traffic and become public infrastructure. We do recognize that there are situations where it is an advantage to both the program and the applicant to install a WAN line, rather than to have it owned and operated by a service provider. Those limited instances are restricted to situations where a singe public right-of-way runs through a school campus. In this situation we believe that the purchase of a WAN connection should be allowed. Allowing this one time installation would save the program over the long term because of the elimination of an annual fee for digital transmission services.

We do not currently believe that existing program rules inhibit the development or expansion of leased networks. We do not believe that it is in the best interest of

the program to support purchased WANs, except in very limited scenarios where a small scope purchased WAN connection is the most cost saving measure when crossing a single right-of-way on a school campus.

d. If the Commission established a national broadband goal for schools or libraries, what effect would that have on demand for E-rate funding?

The State of Alaska has examined the FCC's current definition of broadband, from June 12, 2008 which has seven tiers. We have interpreted those tiers to be a spectrum of broadband scenarios and feel that Tier 3 (3.0mbps to 6mbps) is the immediate goal of many of our schools and libraries, in order to meet the demands of video conferencing within the State of Alaska. We would support the establishment of a broadband goal only if this goal were at Tier 3 or higher.

We would like to stress that any goal established for today has a short life span, and we would hope that any goal established by the Commission would be of limited duration. Broadband goals are only as permanent as the technology the service and a national broadband goal should strive to anticipate tomorrow's broadband needs, rather than today's needs.

e. We seek comment on these issues as well as other ideas to modify E-rate disbursements and discounts to maximize the deployment of broadband.

The State of Alaska applauds the recent global orders of the FCC, which have made the E-rate program more applicant friendly. In particular, the Bishop Perry Order has removed the outright funding denials which resulted from clerical errors rather than program violations. This leniency has gone a long way to improve applicant frustration and anxiety. Most errors stem from a change over in staff

that handling of E-rate applications and reflect program inexperience, rather than malicious intent.

We would encourage the FCC to give direction to USAC to extend this Bishop Perry type of outreach to the invoicing portion of the E-rate process. While the applicant side of the E-rate process has improved dramatically, the invoicing side of the process still contains many "fatal flaws" that result in forms being processed but no funds being disbursed. For FY2008 invoicing, in the State of Alaska, approximately 10% of our applicants have had invoices processed with zero funds disbursed. USAC procedure does not include outreach to an applicant when an error is discovered on a Form 472 (BEAR form). Once an invoice is zero funded and a letter is sent out to the applicant notifying them of this, it is up to the applicant to begin the invoicing process all over again, literally from scratch. It is our contention that, by correcting an invoicing issue at the time it is discovered, both the applicant and the program administrator's time could be saved.

The State of Alaska is very interested in the overall health of the Universal Service Fund. To this end, we recommend that the Commission reexamine web hosting services as Priority 1. It is the belief of this agency that the there has been pressure to widen the eligible services list to the point where we are now funding well beyond telecommunications and Internet access to support schools and libraries. While there are many services that have been added to the Eligible Services List, web-hosting has associated costs that its providers are often unwilling to unbundle. We believe that if web hosting is to remain eligible it should be a Priority 2 class of service, and as a Priority 2 class of service, no more than 50% of its associated costs should be eligible. The reason for this position is the potential for program waste. Prior to its USF eligibility, the cost of web hosting was identifiable and

relatively inexpensive. Once this service became eligible, providers began to bundle it with other features and the associated costs skyrocketed. To maintain the health of the fund, we caution the Commission against allowing the explosion of growth in this area.

Lastly, we encourage the Commission to look carefully at any new services before granting them eligibility. Our state relies heavily on the Universal Support Fund mechanism to keep our schools and libraries functioning. We recognize that connectivity to the world beyond our borders is instrumental to our future success we do not take this communication lightly. We count on the Commission to be the stewards of this program, to keep it healthy, and to keep the focus on what best serves the education and communities in our state. We hope that you will err on the side of caution when it comes to expanding eligibility of services so that this support mechanism is viable over time.

E-RATE FUNDING

13. We seek comment on the implications of modifying E-rate funding to support additional broadband deployment and how changes to the E-rate program would improve the ability of the program to meet applicant needs for broadband.

a. To what extent does the annual E-rate funding cap of $2.25 billion limit the extent of broadband deployment by eligible schools and libraries?[24]

The State of Alaska encourages the Commission to raise the E-rate annual $2.25billion funding cap. We believe that this is necessary in order to support Priority 2 funding requests that support broadband projects within our state. The current funding cap has limited the amount of Internal Connections funding. It is not enough to have connectivity to our schools and libraries. Those applicants must be able to utilize the broadband once they have access to it. Our schools and libraries have much needed LAN construction projects and many of our highest poverty areas have had to put the installation or upgrades to these projects on hold in order to address the rapid growth of energy costs in rural Alaska.

We feel that the funding cap does not currently allow the program to address demand. We encourage the Commission not to expand eligible services within the program until we reach a time where the cap has been adjusted to meet demand. We also encourage the Commission to carefully consider any additions to Eligible Services. It seems that we have seen a recent addition of services (such as web hosting) that have gone well beyond basic connectivity to schools and libraries. We recognize that raising the cap would require an adjustment to the contribution factor or a reallocation of dollars from other areas of the fund.

[24] *See* 47 C.F.R. § 54.507(a).

The State of Alaska would support the consideration of a 5th and separate fund that would be administered by USAC, much the same way that the E-rate fund is administered. If it is determined that this would be the best means of assisting those applicants that can not currently afford broadband connectivity through E-rate support alone, we recognize that it may be necessary to have a 5th division within the Universal Service Fund. While we would support the modification of existing discount designations or the structure of the discount matrix itself, we realize that the best way to address this problem might be to establish a division which applicants could apply to in addition to the E-rate fund in order to assist applicants in acquiring broadband connectivity.

b. To the extent the Commission modifies its E-rate rules to encourage additional requests for funding for broadband services under priority 1, how would that change likely impact the availability of funding for priority 2 services?

We believe that, unless the funding cap is raised, any modifications in the existing E-rate program will, rightfully so, be modifications that allow larger discounts to underserved applicants. These modifications will result in more funding expended under Priority 1 services. To the extent that the E-rate FY2009 was unsure of its ability to meet the 90% discount demand *without $900 million dollar rollover money*, we seriously question the availability of any Priority 2 services in the future

c. To the extent that commenters believe that providing additional funding above the current cap would advance broadband deployment, we seek comment on what additional amounts would be

needed to achieve specific levels of broadband connectivity. Commenters should identify all assumptions regarding their dollar estimates.

We believe that the funding cap will need to be between $4.5 billion and $5.0 billion annually if we are to afford all applicants the broadband connectivity that the Commission desires and keep available Priority 2 funding for applicants as well. In FY2009 it required a $900 million dollars in rollover money in order to fund down to the what will most likely reach the 80% discount applicants. If we are to increase Priority 1 spending through assistance to those applicants currently underserved in broadband connectivity, we will see less funds available to the Priority 2 services that fund the supporting LANs of the neediest of our applicants. It is for this reason that we anticipate a $4.5 to $5 billion cap which would allow additional funding for Priority 1 broadband requests, as well as the accompanying Priority 2 funding to support the Internal Connections necessary to take advantage of that broadband capability.

d. The Commission could decrease the discount levels for basic telecommunications, or otherwise modify the existing discount levels, to increase the amount of E-rate funds available for broadband deployment. What would be the effect of such a change?

The State of Alaska believes that the Commission should consider the restructuring of the Priority 2 funding discount matrix to allow for a greater applicant contribution to Internal Connections. We think that lowering the maximum discount available from 90% to 70% will have a dramatic effect on making Priority 2 funds available to more of the applicants within our state. Having to pay a larger portion of the Internal Connections costs will give applicants the motivation necessary to be purposeful in their planning so that the expenditures that they make are both necessary and the most cost effective means to achieve their planning.

We believe that this will help to keep program waste and abuse to a minimum, and at the same time allow more of our applicants the opportunity to obtain Priority 2 funding under the current funding structure. We envision that the discount matrix would be downwardly adjusted, while the Priority 1 discount matrix would remain untouched.

e. Would eliminating some of the services currently eligible and expanding eligibility to other services result in greater levels of broadband connectivity? Commenters should specifically articulate how proposed changes in the eligible services list would enable greater broadband deployment.

We believe that only those services that a provider can assign an exact cost to should be eligible for Universal Support. We have seen an increase in bundled services, such as web hosting, where the provider is unable or unwilling to assign an exact price to a particular service. We do not believe that this is in the best interest of the fund and the ability to promote bundled services is an area of potential program abuse. We suggest that bundled services, which contain ineligible components, should not be funded until such time as the provider is able to unbundle those services and assign a specific cost to them. As an example, we believe that a provider should assign a specific cost to web hosting, and that they should not be allowed to tell an applicant that their package is eligible for E-rate services when in fact only the hosting component of the package is eligible for support. This would allow applicants to make a true comparison between potential providers, and would save the program. Reducing waste in any area of the fund will make more money available to the internal connections that are fundamental to the utilization of broadband connectivity.

We believe that caching services (also known as “accelerators”) should be added to the future Eligible Services Lists because they allow schools and libraries with inadequate bandwidth to pre-position content on-site for more efficient use of bandwidth.

f. What other costs not currently covered under the E-rate program would be incurred if schools and libraries could purchase additional broadband capacity?

Would schools and libraries have to upgrade personal computer equipment, internal wiring, servers, and other hardware?

We believe that schools and libraries would have to invest additional funds in hardware, software, and infrastructure if they were to increase their broadband capacity. We believe that investments in those areas will always be present, but should not be limiting factors that prevent us from moving forward in a quest for increased broadband connectivity. We believe that it is essential that we provide our schools and their libraries with the connectivity which is a given in other parts of the country. We believe that it is our obligation to ensure that our schools and communities have the connectivity necessary to provide 21st Century communication and access to information. In a state with vast geographical distances we are challenged with providing equal access to all of our students and their communities. Broadband availability in all regions within the state has gone a long way to leveling the playing field with respect to the availability of quality distance delivery in education. Our students, via remote access, can have the connectivity speeds necessary to participate in real time projects taking place across the state or around the world. We will continue to seek support to assist us in providing the software, hardware, and infrastructure necessary to utilize this

connectivity, and we encourage the Commission to recognize the ever rising costs of connectivity by raising the funding cap to help bridge that gap.

g. Additionally, we seek comment on suggestions for coordinating with federal or state agencies on grant programs that could supplement the Commission's E-rate program. For example, the United States Department of Education's Enhancing Education Through Technology State Program (Ed Tech) provides grants to state educational agencies to improve student achievement through the use of technology in elementary and secondary schools.[25] *Money from grants such as this, in combination with E-rate funds, could greatly increase a school's broadband connectivity.*

The State of Alaska encourages the Commission to look at ways where other state or federal agencies could support one another in utilizing E-rate funding. Particularly, we currently can not apply for and receive funding in collaboration with our state's Rural Health Care Program. We believe that this creates separate networks where in fact our rural communities can often only support one network which could be shared. That is one example of two separate Federal Support mechanisms that do not currently allow for collaboration that would ultimately allow for cost savings to the overall Fund.

h. Alternatively, E-rate funds could be used in conjunction with funds from other entities to support broadband projects. For example, upon a state's recommendation, a particular project might be funded by having the state pay for the computers and training, and providing E-rate discounts for the broadband connection. Are there other specific ways the Commission could better leverage the benefits of E-rate funding through coordination with other federal, state, local or non-profit programs that seek to advance broadband deployment?

[25] http://www.ed.gov/programs/edtech/index.html (last visited Aug. 28, 2009).

The Commission should establish working groups and meet regularly with representatives of federal, state, local and non-profit programs to establish policies and procedures for coordinating the existing patchwork of programs and funding resources.

Although the National Broadband Plan may be delivered to the Congress in February 2010, it is a plan that will literally never be completed. The Commission must include in the plan itself the sustainability model the Commission intends to follow in maintaining the viability of U.S. competitiveness as a digital economy. Just as the Commission expects E-Rate applicants to up-date their Technology Plans periodically, so must the Commission upgrade its own plan as a model for others to follow and fulfill. No one wants to see the plan being used as a door stop a few years from now. It will only live on as a digital document, a document that both remains timely and relevant and which invites continuing feedback from all parties interested in the broadband future.

i. We seek comment on these suggestions and other ideas to increase the amount of E-rate funds available for broadband technologies, or to more effectively use E-rate funding to improve broadband deployment.

The State of Alaska encourages the Commission to consider other sources, within the Universal Service fund, and outside of the current $2.25 billion cap to be considered for assistance to help meet the non-discounted portion of the costs associated with reaching broadband connectivity in those applicants currently underserved.

The low degree of home computer ownership, particularly in smaller rural communities, should also be a subject of study, as well is the lack of ITC training opportunities in the same communities. For greater insight into rural schools, see Why Rural Matters 200: State and Regional Challenges and Opportunities, A Report of the Rural School and Community Trust Policy Program, September 2009.

http://files.ruraledu.org/wrm09/WRM09.pdf

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14. We seek any additional case-studies, research and other evidence that may provide additional insight into the types of questions asked in this document.

Relevant References:

- Southeast Alaska Community of Kasaan Joins The Broadband Digital Age With A Community Connect Grant From USDA Rural Development http://www.rurdev.usda.gov/rd/stories/AKKasaanBroadbandsuccess.pdf
- One-to-One in Alaska *By Tom McHale, March 15, 2007* http://www.techlearning.com/article/7076
- High school laptop program gets late start. Teachers' hopes high for next year. By Jeremy Hsieh Tuesday, May 05, 2009 http://juneauempire.com/cgi-bin/printme.pl
- An Inside Look at AASB's Consortium for Digital Learning 1-to-1 Initiative: CDL Mid-Project Summary Report Prepared for the Association of Alaskan School Boards by Dr. Jason Ohler Fall, 2009 15-page PDF http://web.mac.com/aasb.cdl/Consortium_for_Digital_Learning/CDL_Progress_Report_files/Ohler_CDL_Progress_Report.pdf
- Broadband Metrics Best Practices: Review and Assessment. Report prepared for the Massachusetts Technology Collaborative By William Lehr1; Tony Smith-Grieco; Grace Rusi Woo; Massachusetts Institute of Technology, February 2008

http://www.masstech.org/broadband/docs/BroadbandMetricsBestPracticesSurveyFeb2008.pdf

- Discussion of teledensity metrics ; http://www.caslon.com.au/metricsguide8.htm
- *School District to hold hearings on budget cuts: School Board Member Jeff Friedman says schools may have to increase class sizes and increase other services to save money.* (Jason Kohler/KTUU-DT). The school district projects a $15.4 million shortfall for next year. By Ashton Goodell Tuesday, November 03, 2009 “"Possibly one of the ways to try to save some money might be in reducing the temperatures inside some of our buildings," said Crystal Kennedy, a school board member. Another suggestion was to hold off on some computer upgrades.” http://www.ktuu.com/Global/story.asp?S=11439045
- *Proposed Budget for Anchorage Library Means Layoffs, Service Cuts*14 positions could be lost; materials could be cut 12 percent Lynn Blumenstein -- Library Journal, 10/28/2009 Library system could lose 13.5 % of already lean staff *Eagle River, Chugiak feeling deep budget cuts from city* Friday, November 6, 2009 EAGLE RIVER, Alaska -- Also hitting the area, the hours at the brand new branch library, which has the second-highest circulation in Anchorage, will be cut back …http://www.ktuu.com/Global/story.asp?S=11461852